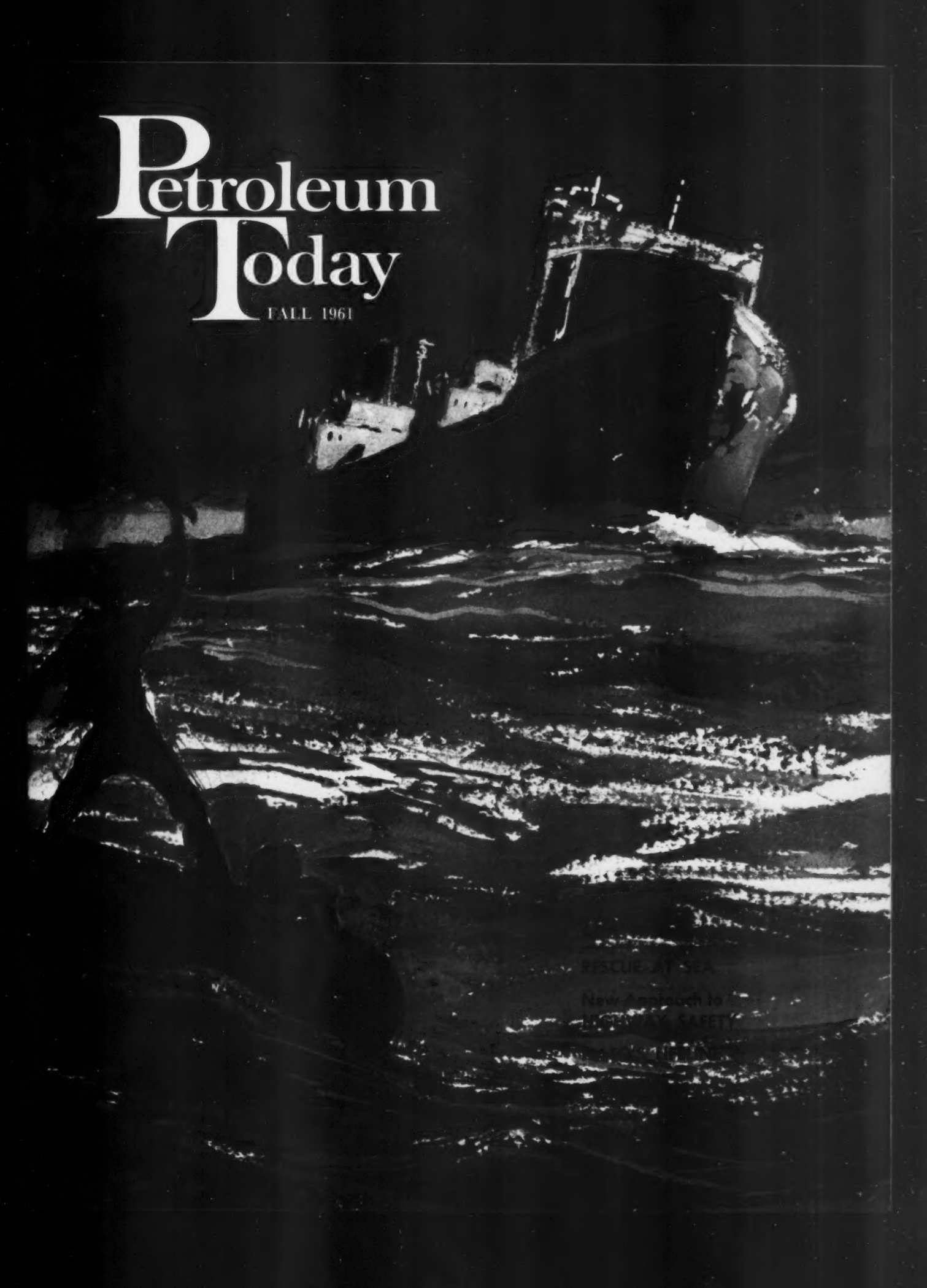
Petroleum Today

FALL 1961



Petroleum Today

VOLUME III • NUMBER 1

American Petroleum Institute
1271 Avenue of the Americas, New York 20, N.Y.
M. J. Rathbone, *Chairman of the Board*
F. M. Porter, *President*

Contents

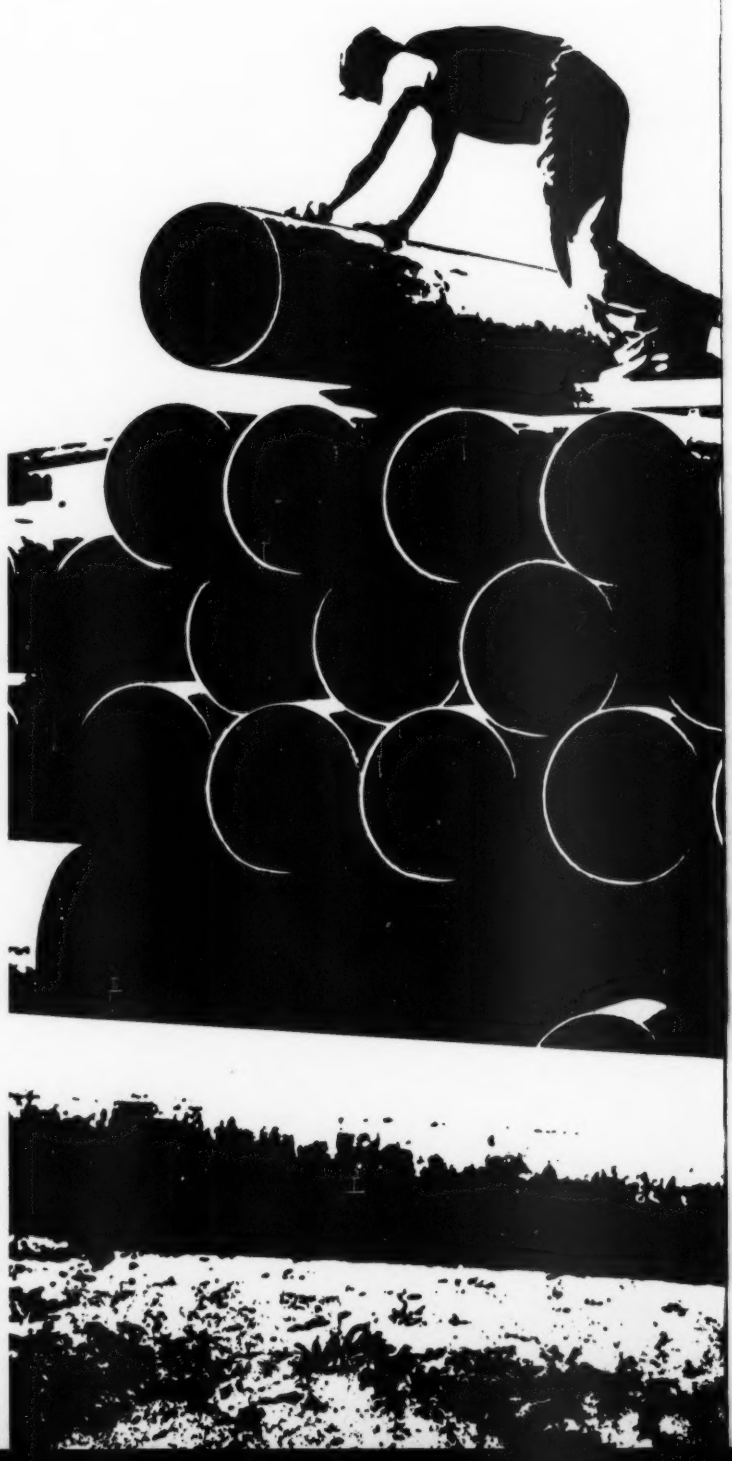
NATO's Lifeline
by James H. Winchester 1
A New Approach to Highway Safety
by Joseph C. Ingraham 5
They Penetrate the Veil of Time
by Jerry Klein 8
Life in Outer Space
by Edwin Diamond 10
Lady in the Oil Patch
by Duane Valentry 14
Twin Parks 16
Rescue at Sea
by Tom Allen 18
Petroleum Potpourri 22
Inside Industrial Psychology
by Charles Paul Sparks 24
Hurricane
by Ernst Behrendt 27
Sunburn Seminar
by Edward McGrath 30

Published quarterly by the Institute's Committee on Public Affairs as a contribution to public understanding of the petroleum industry. Articles may be reproduced in whole or in part. Credit to PETROLEUM TODAY is requested.

Robert W. Stock, *Editor*
Edward W. Atkinson, *Associate Editor*
Libby-Ann Watterson, *Associate Editor*

Photo and Art Credits

Cover and pages 19 and 21 — John Pike; inside front cover and page 9 — Standard Oil Co. (N.J.); page 3 — NATO; page 5 — L. Willinger from Shostal; pages 10-11 — Mount Wilson and Palomar Observatories; page 12 — The Bettmann Archive; page 13 — Esso Research and Engineering Co.; pages 16-17 — Robert Schwartz; page 22 (top left) — Schlumberger Well Surveying Corp.; page 22 (bottom left) — Socony Mobil Oil Co., Inc.; pages 22-23 (center) — Tennessee Gas Transmission Co.; page 23 (top right) — Shell Oil Co.; page 23 (bottom right) — Sunray Mid-Continent Oil Co.; page 27 — Jim Katzel; pages 28-29 (top) — Standard Oil Co. of California; page 29 (bottom) — Humble Oil and Refining Co.; page 30 and 31 (top) — Empire State Petroleum Assn.; page 31 (bottom) — Edward McGrath; inside back cover — Ohio Oil Co.



NATO'S LIFELINE

A farflung network of underground pipe plays a vital role in the defense of Western Europe.

by James H. Winchester

THE CONCRETE-LINED room is buried deep in the face of a cliff above the Moselle River, not far from the historic city of Metz in northeastern France. The room bristles with dials and meters and valves; the clatter of the teletype machines never ceases.

From here, civilian specialists, with the flick of a finger, direct the flow of a bulk of the fuel supplies going to the land and air forces of the North Atlantic Treaty Organization (NATO) in Western Europe. If war were to break out tomorrow, the actions taken in this room, and along the length of the giant pipeline it serves, would play an important role in the outcome.

The NATO pipeline complex supplies more than 200 NATO airfields and almost as many ground force points along an arc stretching from the top of Norway to eastern Turkey, a perimeter of more than 4,000 miles. Begun in 1952, the underground network will be finished next year. Total cost: more than $400 million.

In World War II when Allied troops pushed out of the Normandy beaches to move across France toward Germany, fuel supply was a bottleneck. Entire divisions, lacking gasoline, were sometimes bogged down for days. Battles and lives were lost.

A makeshift, temporary pipeline was finally stretched across France, resting exposed and vulnerable on the surface. Most of the fuel for the front, however, moved by round-the-clock truck convoys, including the famed Red Ball Express. Both the pipeline and the convoys were often put out of business by strafing, bombing, and artillery fire.

In the years since, the military requirements for fuel have grown. A NATO ground division, for example, needs more than 1,000 tons of petroleum products a day to keep in action. A supersonic fighter-bomber wing needs even more. The present underground NATO pipeline system was designed to fill these needs.

The heart of the system is the Central European network, 3,000 miles of linked lines spinning out across France, West Germany, Belgium, Holland, and Luxembourg. An additional 2,000 miles of separate, unlinked systems (unconnected either to the Central European network or to each other) supply NATO installations in Norway, Denmark, Greece, Turkey, and Italy.

In all, this complex now encompasses some 5,000 miles of buried pipelines, ocean tanker terminals in various NATO countries on the Atlantic and Mediterranean shores, numerous bombproof pumping and control stations, and scores of underground depots. (The exact numbers and locations of these military pipelines, terminals, and storage areas—as well as the points they serve—are classified matters.) In addition, the NATO system is connected to the separate, older $60 million American military pipeline running 300 miles across France to U.S. airfields in West Germany. Fuel can be diverted into the U.S. system from the NATO pipelines, a good example of the built-in flexibility of the defense network.

To understand the unique character of the NATO pipeline complex, it is necessary to know something about the role and structure of NATO itself.

NATO is not a supergovernment. Each of the 15 member nations retains the right to decide for itself what action it will take if aggression occurs. The top policymaking body is a civilian group called the North Atlantic Council. It meets several times yearly. Each member nation also has a permanent represen-

Those who participated in the landing in France in June 1944 and had to "go forward" can remember how they sometimes were balked by the shortage of fuel when and where it was vitally needed.

In order to preclude such a situation, should the free world be called upon once again to defend its territory and institutions, NATO has built an extensive pipeline complex, including tanker discharge, storages, refueling points, for ground and air forces throughout NATO countries with all necessary connecting lines. This article conveys in excellent fashion how this was planned and built and how it operates in the framework of the North Atlantic Treaty Organization.

DIRK U. STIKKER
Secretary General

tative, with the rank of Ambassador, at NATO headquarters in Paris. A Secretariat Group, representing NATO as a whole, is headed by Secretary General Dirk U. Stikker of the Netherlands.

Supreme military authority in NATO is vested in the Military Committee, made up of the chiefs of staff of the member nations. Of the several commands under this body, the one with which we are here concerned is called Allied Command Europe. Its headquarters (Supreme Headquarters Allied Powers, Europe—SHAPE) is just outside Paris, and its top commander is U.S. Air Force General Lauris Norstad.

The plan for a permanent NATO petroleum pipeline system originated among the top planning experts at SHAPE. The North Atlantic Council approved the project in December 1952.

The building of the NATO pipeline raised problems of a type seldom encountered before. With a few rare exceptions, there had been no major pipeline construction in Western Europe; thus there were practically no European personnel experienced in pipeline design, construction, or operation. Regulations and standards were different in each of the nations involved. Modern equipment was scarce.

In some of the countries recruits from local oil companies manned newly created bureaus. In others, design and supervision of construction was contracted to consulting engineering firms. This supervisory work went largely to American companies on the basis of their know-how and experience.

At NATO a new staff section known as POL (Petrol, Oils, and Lubricants) was set up with an international civilian staff. Several veteran U.S. pipeline men have headed this top-level group; they were granted leaves of absence by their companies and were placed on U.S. Government payroll.

As the pipeline progressed, each step had to be cleared with appropriate authorities in the various nations—each country had its own particular standards. All materiel used was subject to international competitive bidding from all 15 NATO member nations. Each nation differed from the others in its specifications, customs regulations, and taxes.

The actual construction practices had to be made to conform to local rules. In one country, the contractors were unable to move laborers away from the "home" district, with the result that all unskilled labor had to be discharged and new men hired about every six miles of line.

The lack of modern equipment slowed construction. As an example, the lengths of pipe were often bent at the factory, there being no adequate pipe-bending equipment available at construction sites. Thus it was sometimes cheaper to eliminate the need for having a pipe bent by digging an extra section of ditch. At one site there were no skids upon which the lengths of pipe are normally placed to be welded together. Metal chairs of uniform height were found, and they served the purpose.

With such problems to be surmounted, the rate of construction has been slow; but the end result has been satisfactory. The economy and efficiency of petroleum pipeline transportation, demonstrated most notably in American oil industry operations, has been proved in the NATO system as well.

And the solutions of some of the problems engendered by the pipeline network have seemed to some observers to have important implications. Many of the lines, for example, crossed national boundaries, raising customs disputes. After much study and actual operation, the five nations involved have worked out a system of cooperation for common defense. Military fuel bought by any of the eight user NATO nations is allowed to move across these frontiers unimpeded and free of tax and customs charges in time of peace as well as war. To many, this economic agreement is as big, in its own way, as the construction of the pipeline itself.

The operation of the complex system requires an extremely efficient technical organization. Personnel had to be recruited and trained to handle the job. Today more than 1,000 civilians are employed on the Central European network alone. They man the seven national divisions of the network: One in

ABOVE: *In the winter of 1957 a section of the North Atlantic Treaty Organization's oil pipeline system was laid across the placid Saone River in France.*

BELOW: *The windswept sands of an area bordering the English Channel were the site for construction of a giant petroleum tank farm linked with the NATO pipeline network.*

Cooperation among NATO partners is symbolized by the refueling of a French Air Force jet fighter at a Royal Canadian Air Force base in France. More than 200 airfields are served by the NATO pipeline.

"A tough, exciting job."

The U. S. pipeline experts who aided in the design and construction of the NATO pipeline system have not forgotten their tours of service in Europe. "It was a tough, exciting job," one of them recalls.

Most of their memories are of the new way of life to which they were exposed, the new languages, the new foods. Important details of the project they will not discuss; they all took oaths of secrecy before leaving the job.

One man learned to enjoy exotic cookery: "I'll never forget the first time I saw that baby octopus lying there on the plate, tentacles and all." Another became fluent in French, though it wasn't absolutely necessary since English was understood in most areas: "I can still get along in a French restaurant."

Mapping the pipeline route by plane proved hazardous for two of the pipeliners. The first remembers squeezing between the mountaintops of southeastern Europe in a four-engined DC-4: "It just wasn't the plane for it." The second has vivid memories of hours spent flying up and down the fog-bound fjords of a Scandinavian nation in search of a landing field.

One problem encountered was familiar to the Americans. Property owners were often unenthusiastic about granting a right-of-way for the pipeline—even though they received reimbursement and even though the line would be underground. Farmers were sure that no crops would grow again in the area through which the pipeline would be laid. (They've been proved wrong.)

Fortunately, most such negotiations were handled by local officials. The U. S. pipeliners and their European counterparts were "most congenial." And their joint efforts in the common defense were crowned with success.

the Netherlands, one in Belgium, two in Germany, and three in France. Each division is in touch by teletype with its neighboring divisions, and also with every pumping station in its own area of control. It is also in constant touch with a central coordinating control center known as the Central Europe Operating Agency—also manned by civilians but supervised by the military.

This central agency ensures that the network runs as an integrated, uniform system. It directs the overall activities of the seven divisions in all their routine technical operations and coordinates most other matters including security and nuclear defense. It is also responsible for maintaining the most accurate accounting for fuel, in itself a very complex series of operations.

A tanker might unload at an English Channel port, for instance, and its cargo, pumped through the main line, be diverted to forces of Holland, France, the United States, Great Britain, West Germany, and Canada, each getting a portion of the total. Each country pays for its own fuel; so complicated bookkeeping becomes necessary.

This central body also plans, at least a month ahead, the international movement of fuel through the pipeline system to meet the needs of the eight user nations. Its communications system is such that an order can be passed in a matter of minutes to any pump or fuel point operator. At the same time, this headquarters is also kept completely informed at any given moment of the precise fuel situation in all the territories covered by the network. It maintains constant touch with military headquarters.

The Central European network is run on a common annual budget of about $5 million. Another $3 million or more will be required to run the separate, unlinked systems in Scandinavia, Italy, Greece, and Turkey when they are completed. Each country pays for the fuel its forces use plus its due share of the operating costs, but the construction of the pipeline system—because it is built for the benefit of NATO as a whole—is on a common cost-sharing basis.

The NATO pipeline system was built for military needs, and experts see only a limited commercial value in it. For one thing, Europe's major oil companies have set up—or are building—an increasing number of refineries near large distribution centers, doing away with the commercial need for this type of pipeline.

However, since the NATO system is geared for war, it is tied in with a number of adjacent European commercial oil installations and can be linked to them with a twist of a valve.

Today the NATO network uses only a fraction of its designed capacity. "It will really pay off," says a NATO spokesman, "if the balloon ever goes up."

a new approach to HIGHWAY SAFETY

by JOSEPH C. INGRAHAM

The experts have been taking the wrong tack, says this prominent editor. He suggests: "Let's strip the motorist of his amateur status and let's make him a 'professional.'"

AMERICANS HAVE a passion for packaging problems, and nowhere is this more pronounced than in highway safety. One favorite package, for example, seeks to state the whole problem in sweeping prose: "The Car, The Road, and The Driver." The trouble with packaging is that it solves nothing. The experts can come up with new verbal approaches and new definitions in an endless variety —and they do—but the problem remains far from solution.

Since 1904, when there were only two automobiles in Kansas City, Missouri, and they were in a collision, it has been accepted that accidents are caused in the main by human failure. From time immemorial it also has been accepted dogma that: 1. Drivers are inherently unreasonable creatures. 2. Drivers must be frightened or berated if they are to act sensibly behind the wheel. Only of late has there been any thought given to the possibility that the majority of drivers will act sensibly if given a chance.

The fact that these two items of dogma are being questioned gives rise to hope that we may at last be on the road to improved highway safety programs. It also suggests a possible approach to the motorist, one that has had few supporters in the past.

I say: "Let's strip the motorist of his amateur status and stop downgrading him; let's make him a 'professional.'" Operating high-powered cars on high-speed roads is a skill that must be learned, a skill I believe the motorist will want to learn if he is approached in a straightforward, matter-of-fact manner.

The pioneer safety experts set up shop more than four decades ago; yet it has been only three years since they gingerly started to explore the underlying causes of accidents by asking motorists what they really thought about traffic safety. The results of this exploration have begun to appear, and they are eye openers.

Thousands of drivers were questioned during a

JOSEPH C. INGRAHAM, *the automobile editor of* The New York Times, *is the author of* MODERN TRAFFIC CONTROL.

study financed by a trucking association and an oil company for the President's Committee on Traffic Safety. It was found that drivers ignored safety messages; they believed they were doing the right things —it was the "other fellow" who needed advice.

Columbia University studies have shown that under certain conditions no driver is immune from unsafe behavior behind the wheel. A program is being developed to lessen the motorist's basic egotism, to make him aware that he can be the "other fellow."

Perhaps the most fascinating study is that being carried out by Harvard University with an $809,000 Federal grant. It is the first "grave-to-cradle" investigation of automobile accidents. The errant driver and his psychological makeup are explored in depth, all the way back to infancy—when his vehicle was a tricycle or a kiddy car.

There is, however, no need to wait for 1963. The evidence clearly indicates the direction in which safety programs must move. There must be an improvement in driver training and education and in licensing procedures; there must be an improvement in traffic laws and in their enforcement.

Today driver training is too often limited to the high school level; and even within that framework the bulk of the time is spent in the classroom. On-the-road experience is limited, with the result that the young driver knows a lot of theory and very little about the split-second decisions he will have to make to stay alive.

Business and professional men go back to school for refresher courses in their fields. Why shouldn't adult motorists do the same thing? Is driving less important? How otherwise will they keep abreast of changes in laws or improve correct driving techniques that may have become slipshod?

In all cases, in the high schools and elsewhere, the appeal should be made to the driver's pride, to his desire to improve his driving skills; and the instructors should be specially trained to do the job. For the way in which a driver is told what he has been doing wrong can spell the difference between wasted time and accident prevention.

Emphasis must also be placed on educating and improving those who have demonstrated driving weaknesses in a concrete manner—the motorists who have contributed to accidents. New Jersey is one of the States pioneering in this field; accident prevention clinics have been established for offenders. Included in the program is a series of psychological tests to find the reasons for their difficulties.

If there is to be effective driver education, there must be an incentive; the motorist must be made to want to be a "professional." Where is the incentive to come from?

Part of the answer lies in a realization that drivers do have a desire to learn and to improve. An example: The study made for the President's Committee included a number of questions about "navigating the new superhighways." The drivers tossed the questions right back at the interviewers. "I don't know. But tell me; I want to know." This latent desire should be capitalized on.

The problem of incentive can be traced directly to the attitudes of the States themselves, as reflected in driver licensing procedures. Becoming a licensed driver would appear to be a small matter requiring little effort—hardly something that requires a "professional."

The ease with which a license can be obtained is exemplified by the practice in New York State, where the average road test lasts five to six minutes. It takes place within an area of a few blocks, usually well away from the heaviest traffic. About all that is necessary to qualify is the ability to make a proper left or right turn and to park without hitting another car. The novices seldom need prove that they can handle an auto on the open road or under the varying conditions that regularly confront a driver.

Once a driver is licensed, and as long as he stays out of serious trouble, he is, with few exceptions, im-

Reverse Psychology

Reporters and editors are constantly engaged in the hunt for the day's most important story, something to hang a big headline on. There are some days of the year, however, when they can relax: Labor Day, Fourth of July, Memorial Day, to name a few. The big story is highway fatalities.

"Holiday Death Toll Mounts" is the form the headline often takes. The theory has been that motorists will act more reasonably if they are sufficiently frightened. But of late there has been considerable criticism of the publication of such figures. Dr. James L. Malfetti, director of the Safety Education Research Project of Columbia University, contends that "fright campaigns" to promote safer driving may do more harm than good. He suggests that the psychological effect of overemphasis of "scare statistics" may actually encourage the very accidents they seek to prevent.

Expert Confusion

The number of Americans injured in highway accidents in 1960 was either 4,388,000 or 1,400,000. Both figures are estimates. The first figure comes from the U. S. Public Health Service. It is a projection based upon more than 110,000 interviews a year. It includes accidents, no matter how trivial, that caused the victims to restrict their usual activities for at least a day, including the day of the mishap. The second figure comes from the National Safety Council. It is an approximation based on a ratio of disabling injuries to deaths, developed from special studies. It includes only persons disabled beyond the day of the accident.

mune to examination for renewal. He may give up steady driving, he may lose any skills he had, he may be weakened physically by age or illness; but any time he wishes, he may take the driver's seat. His license will be automatically renewed.

Pennsylvania has come up with a solution to this situation. A program has been begun there under which *all* drivers are to be given regular physical and mental examinations that they must pass to obtain and to keep driving licenses. This is an important step in upgrading the process of driving, in making the driver consider himself a "pro."

If the beneficial results of such a program are to be maintained, however, there must be a continuing application of high standards and good sense in the day-to-day traffic situation. There must be strict enforcement of sensible laws.

Politics, in one form or another, is the traditional stumbling block in the way of strict enforcement. When there is a call for harsher driver licensing procedures, for example, legislators are quick to remember that the motorist is also a voter. The Rhode Island General Assembly recently passed an act giving the registrar of motor vehicles new authority. If a traffic violator has his license revoked, and if he must drive to earn his living, then the registrar may give him a special license. Comparable pressures are brought to bear at the police and court levels when demands arise for strict and impartial enforcement.

Of course, virtually every State and community at some time or other experiences a period of strict law enforcement. But all too often the period is a short one. Studies have shown that though motorists say that they feel it is just as wrong to break a traffic law as to steal, the majority of them want warnings handed out instead of tickets. With such evidence at their fingertips, the politicians do indeed seem to speak for the people—and the enforcement officials listen.

Yet there is opposing evidence as well. It comes most notably from Connecticut, where the then Governor, Abraham Ribicoff, decreed several years ago that speeders would lose their licenses for 30 days after a single conviction. Later he provided even harsher penalties for reckless driving. The highway death toll showed a dramatic decrease. And Ribicoff was reelected by a handsome margin, despite his action, which had been called "political suicide."

Law enforcement is a vital aspect of the traffic safety picture, but it can be no better than the laws and traffic regulations themselves. The need is not for more laws so much as better ones.

The prime example of a weakness in the traffic laws and regulations is the unrealistically low speed limit. Even the police tacitly acknowledge the widespread nature of this situation by allowing drivers a five- to 10-mile-an-hour tolerance.

Everyone agrees that speed kills, but there is sharp disagreement as to how this statement is to be interpreted. The weight of the evidence is that speed too fast for conditions—rather than speed per se—is the cause of most road mishaps. The New Jersey Turnpike Authority has set a legal speed limit of 60 miles an hour under normal conditions. When fog or ice or other adverse elements make such a speed unsafe, the limit is lowered to 35. Almost without exception, it has been found, motorists obey the lower limit. It is reasonable, and they know it.

Conversely, motorists flout unrealistic traffic laws. Bad law is an invitation to lawbreaking—not to be tolerated, but to be changed. At one time the speed limit on the Merritt Parkway in Connecticut was 40 miles an hour. The degree to which drivers ignored the limit was dramatically demonstrated when two State Police cars, driving below the limit, patrolled the two-lane highway side by side. The traffic backup was several miles long. So Connecticut raised the speed limit to 55 miles an hour and—as we have noted—enforced it.

These, then, would be a start on a new approach to traffic safety: Reasonable laws, strictly enforced; meaningful licensing procedures; driver training and education aimed at challenging the motorist.

All have in common a basic assumption: If you give the driver a sense of pride in his driving skill, and if you set high standards for him to achieve, he will meet the test. A nation of motorists who look upon driving as a challenge and themselves as professionals will be a safer nation.

They Penetrate the Veil of Time

by Jerry Klein

TWO GEOLOGISTS walked slowly through the dusty, sun-baked canyon in Utah. Only their footsteps broke the silence. Their eyes searched for rock formations that might give clues to the presence of oil.

Suddenly one of them shouted and pointed toward a rock jutting from the canyon wall, some 200 feet up the slope. "What's that?" Without waiting for an answer, he began to clamber up the wall.

When he reached the rock, the geologist's eyes lit up with an excitement that had nothing to do with oil. Before him lay an eight-foot, 1,000-pound slab splattered with the fossilized footprints of several creatures that had inhabited the area 50 million years before.

All the rest of that broiling-hot day the two men grunted their way up and down the crags, trying to bring the rock down. At last they succeeded in lowering it on a sled made of planks.

Today the slab rests in the Smithsonian Institution. It bears, almost perfectly preserved, the tracks of several extinct three-toed mammals, an animal resembling a dog, various birds, a strange catlike creature with claws, a possible ancestor of the modern horse. It provides scientists with an exciting picture of life in the Eocene Epoch, as written in the then mud flats of Utah long before man appeared on the site.

Oilhunters never know what they'll find, and that uncertainty applies to drillers as well as to surface geologists. In the course of their labors, oilmen often enter remote areas of the world where modern man is a stranger; and in probing the earth, they often lift the veil of time.

At a well site in Wyoming, for example, some slivers of what seemed to be wood were brought up by the drilling "mud," the fluid that is used for (among other reasons) removing rock chips from the bottom of the well. One of the drillers took a few of the slivers to a State university geologist who, after one look, raced for the well. The drillers had bored into the skeleton of a giant mammoth buried in the muck of an ancient spring.

As the geologist reconstructed the story, the beast had visited the watering spot one hot day some 12,000 years before and had slipped into the mud and drowned. The discovery of the mammoth's remains by the oilhunters led to the recovery of one of the best preserved specimens of the beast ever found.

Some years ago an even more dramatic discovery was made by an oilman working in the area near Brea, California. He noticed in a pool of asphalt the bones of an animal he was at a loss to identify. They turned out to be part of a giant ground sloth, an armor-plated beauty long extinct.

Scientists converged on the spot and eventually uncovered a fabulous assortment of prehistoric remains, including mastodons and saber-toothed tigers.

A buried city is discovered

The search for oil has also made its contribution to our knowledge of ancient civilizations. Oilmen have found an entire Mayan city buried in the Guatemalan jungle. They have discovered pottery and jewelry belonging to a little-known Indian culture in Costa Rica; the disappearance of this people remains an anthropological mystery.

In North Africa oil geologists have come upon petrified palm trees far from any oasis, mute testimony to the efficiency of the irrigation system built in the area by the ancient Romans. Examining rock formations in Turkey, geologists have found stone lions left by the Hittites who inhabited the area 4,000 years ago.

Signs of the past discovered by oilmen are often, however, of more recent vintage. Indian artifacts, for example, are a familiar find; much knowledge of the early Navajo and Pueblo Indian cultures on this continent has come from objects uncovered in the process of building pipelines. And sometimes the oilmen's discoveries bear witness to tragedy.

In the Libyan Desert two years ago an exploration party came upon the wreckage of a British bomber, the victim of a wartime mishap. Then two weeks later, and 10 miles away, another party of oilmen discovered the American B-24 bomber *Lady Be Good*.

The hot, dry air of the desert had preserved the *Lady* as though she had come down the very morning she was discovered. Inside the ship were chewing

The men who hunt for petroleum never know just what their search is going to turn up.

gum, chocolate, cigarettes, and jugs of coffee. The hydraulic fluid found in the bomber was so well preserved that, as later tests showed, it could still be used. But the exploration party found no sign of the bomber's crew.

It took months for the U. S. Air Force to unravel what had happened: On the night of April 4, 1943, the B-24 was returning from a raid on Naples when it overshot its base near the Mediterranean coast of Libya and ran out of gas. Its nine-man crew had bailed out and tried to reach safety, but they died and were covered by the shifting sand before they could walk more than a fraction of the distance across the blazing desert. A trail of torn parachute silk, jackets, shoes, and stones led the searchers to the Sand Sea of Calanscio, where the bones of five of the fliers were found.

The list of oilmen's nonoil discoveries is seemingly endless. Drillers in Italy have found huge reserves of live steam beneath the ground; the steam has been harnessed to generate electricity. They have found sulfur deposits that have led to a large and thriving sulfur industry along the Gulf Coast. They have drilled in the desert and brought up fish from an unknown underground stream. They have even, according to legend, found beer!

Dreams of oil are dashed

The scene was northwestern Pennsylvania during the exciting early days of the industry in 1863. The drilling crew had been working for some time when suddenly the bit plunged six or eight feet. The drilling tools were hurriedly drawn to the surface as the crew dreamed of an enormous hole in the ground filled with oil.

When the drill bit appeared, it was seen to be dripping with an amber fluid. The crew had struck beer.

In the drinking party that started immediately, oil was temporarily forgotten. But the fun ended when a brewer rushed up to complain that the crew was guzzling him into the poorhouse. The drill, it seems, had penetrated an underground storage area and had tapped a full hogshead of his product.

The appeal of this unlikely story to modern oilmen is that it could, just possibly, happen again today. For despite the scientific improvements in oil exploration devices since 1863, drilling remains a risky and uncertain business. The chances of a wildcatter's discovering a commercially successful oilfield, for example, are a frustrating one in 49. Who's to say that he might not, some day, find beer instead?

Meanwhile, despite the odds against success, the search for earth's abundant stores of petroleum goes on. The wildcatter considers the prize to be worth sacrificing for, even though his drill bit may bring up fossils instead of fuels.

Questing oilmen came across this stone lion in Turkey. Four thousand years old, it is a remnant of ancient Hittite civilization.

by Edwin Diamond

LIFE IN OUTER

Speculation that other living beings exist in the universe has long been in the somewhat esoteric domains of the philosopher, the poet, and the fiction writer.

In the last three years, however, impressive evidence has been uncovered that strongly indicates that earthmen are not the only intelligent players on the stage of life.

Three important scientific disciplines, each proceeding along separate lines of research, have contributed to this discovery. Scientists engaged in two of them, astronomy and astrophysics, using traditional optical telescopes as tools, have found that the number of planetary systems where life is theoretically possible is quite literally an astronomical figure. But the most important practical evidence that life exists elsewhere comes from a rather unexpected, down-to-earth source. Organic chemists, borrowing techniques and equipment used for petroleum analysis, have recently found what appears to be the first physical proof for the existence of extraterrestrial life.

The implications of this finding are, of course, staggering. Where do these extraterrestrials live? Is it possible to communicate with them? Can they help us solve such problems as war, disease, and aging? We are today in a position to suggest answers to some of these mind-boggling questions.

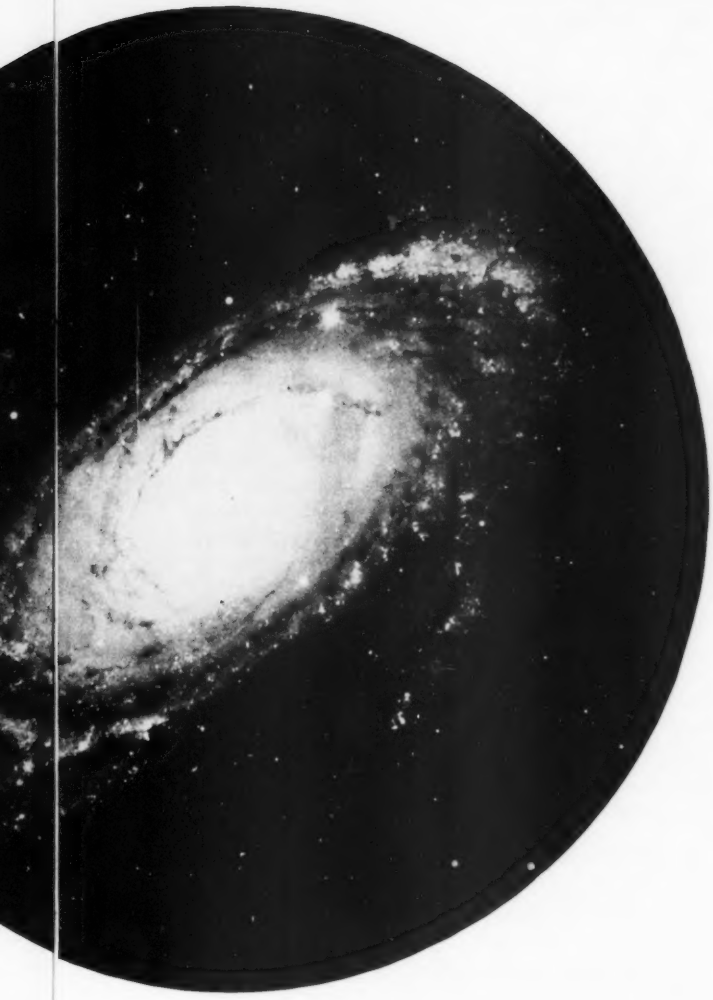
Earthlike life, insofar as science can tell us today, has three basic physical requirements: 1. A star like our own sun, to provide just the right amount of radiation. 2. A planet about the age of our five-billion-year-old earth, so that evolutionary processes can unfold. 3. A biosphere, or envelope of oxygen, hydrogen, and carbon, to make possible the familiar process of photosynthesis (by which green plants use these elements and the energy of sunlight to manufacture carbohydrates, or food, and return oxygen to the air).

Stars: Giant telescopes such as the one at Mount Palomar, California, receive the light of millions of galaxies in space. In these galaxies, astronomer Harlow Shapley, of Harvard, has estimated, there are perhaps more than 10 thousand million billion stars (a 10 with 18 zeros) "essentially identical" to our own sun in size, luminosity, and chemistry, and "all radiating the kind of energy needed for photosynthesis." They are neither too big nor too hot—big, hot stars burn their fuel so rapidly that they die before planetary life can get going. Nor are they too cool to warm up planets.

Planets: Until recently the prevailing astrophysical theories held that planets themselves were extremely rare phenomena, formed when the sun and another star sideswiped each other. In this once-in-a-galaxy-time collision, globs of dust and gas were torn loose to form Earth, Venus, Mars, and the rest of the planets. The solar system, in the words of astrophysicist Otto Struve, of the United States National Radio Astronomy Observatory, "was thought to be the one happy accident."

New observations have thrown out this collision

EDWIN DIAMOND, *science editor of* Newsweek, *has written extensively about various aspects of outer space.*



R SPACE

idea and with it all the arguments for the uniqueness of our planetary system. The new theory holds that our own sun and other stars were formed by the gravitational contraction of whirlpools of cosmic dust and gas. During the long, cataclysmic birth pangs some extra material was left or flung outside the spinning sun and became the planets. Today our own sun rotates on its axis relatively slowly; this, Struve reasons, is because the sun's brood of planets drained away some of the original rotational energy. Therefore, he concludes that a star's slow rotation signifies an accompanying brood of planets. Based on star samplings, in the Milky Way galaxy alone (the galaxy to which our solar system belongs) there may be as many as 50 billion slow-rotating stars. Even if each sun averages only five planets (compared to the nine around our sun), this would mean that there are 10 billion planets in the "local" Milky Way alone.

Biosphere: What are the chances that these planets have the necessary ingredients for life? Here the chemists take over from the astronomers and astrophysicists, and the study of meteorites replaces the study of stars and galaxies. Thanks to these small chunks of matter, the researcher of today can study the chemistry of outer space without leaving his laboratory.

Meteorites are, in effect, messengers from space. Their origin is uncertain. One school of thought, led by Nobel Prize-winning chemist Harold G. Urey, of the University of California, maintains that they are the ancient debris resulting from cataclysmic collisions between cosmic bodies as large as the Earth's Moon. Another school, exemplified by Dr. Edward Anders, of the University of Chicago, holds that they are the fragments of collisions between much smaller bodies. There are also differences of opinion about their age; one estimate is that meteorites may be some 4.8 billion years old—formed about the same time as the planet earth. In any event, the fate of meteorites that fly close enough to the earth to be attracted by its gravity is certain: most burn up in the atmosphere (the familiar meteor, or "shooting star," effect); of those few that survive the hot plunge, some are to be found in museums—blackened rocks preserved under glass.

Two such museum samples of a type of meteorite known as carbonaceous chondrite (because it contains some form of carbon in its molecular structure) have provided key chemical clues in the search for life in space. In the late 1950's a number of investigators, spurred by the intriguing findings of astronomers like Shapley and Struve, hit upon the idea of analyzing the chemical composition of the intact and uncontaminated cores of meteorites. One important group, in Berkeley, California, was headed by Professor Melvin Calvin, the distinguished University of California biochemist. Another group, at Fordham University in New York, was led by Dr. Bartholomew Nagy, professor of analytical chemistry.

The Calvin group worked with a meteorite that had crashed to earth in Calloway County, Kentucky, in 1950 and subsequently had been sent to the Smithsonian Institution in Washington, D. C. The Nagy group used a fragment from the well-documented meteorite that showered down on May 14, 1864, at 8 p.m., near the town of Orgueil, France. This streak-

WHAT ARE THEY LIKE?

If, as the evidence indicates, there are intelligent beings in outer space, the major question becomes: "What are they like?" Professor William Howells, of the anthropology department at Harvard, has ventured some informed guesses in his book *Mankind in the Making*.

Howells doesn't expect to find the "flabby little web-footed goblins with knobs on their heads" that inhabit the pages of comic books. Instead, he suggests that "they" are intelligent, communicating creatures—something like us, perhaps "considerably rearranged."

Based on his study of evolution, Howells reasons that the "Things" would have one head end and one tail end and two arms "with plenty of fingers" on the ends of them. Further, the Things would come in two sexes ("It is an almost universal rule here below, with no complaints.") but need not have two legs. Howells believes the Things are likelier to be centaurlike hexapods (three sets of limbs; that is, two arms and four legs). Insects, he points out, have four legs, and man only goes around on two legs because he had no choice if he wanted hands to use.

Will space centaur extend these hands in amity or enmity when he first meets earthman? "Who will make a nice pet for whom?" asks Howells. The bloody history of man's relationship to man doesn't make the prospect too attractive.

But there is another intriguing and ironic possibility. Dr. Donald Michael, a psychologist who investigated the question of intergalactic communication for the National Aeronautics and Space Administration in 1960, suggests that the extraterrestrials, if they are sufficiently superior, may "choose to have little if any contact with us."

ing journey was observed by many local citizens; some 20 stony fragments, the largest the size of a man's head but most as large as a fist, scattered over two square miles and were gathered shortly afterward. Both the number of observers and the quick collection are important because if a meteorite is to be of value in chemical analysis, its authenticity must be well established.

The amount of organic material embedded in these samples and available for study was necessarily small, so small in fact that few universities in the country have the special mass spectrometers required to make the analyses. Oil company research facilities, however, have this equipment, and made it available for meteorite research. Both Calvin on the West Coast and Nagy on the East were able to use petroleum industry facilities in their respective areas.

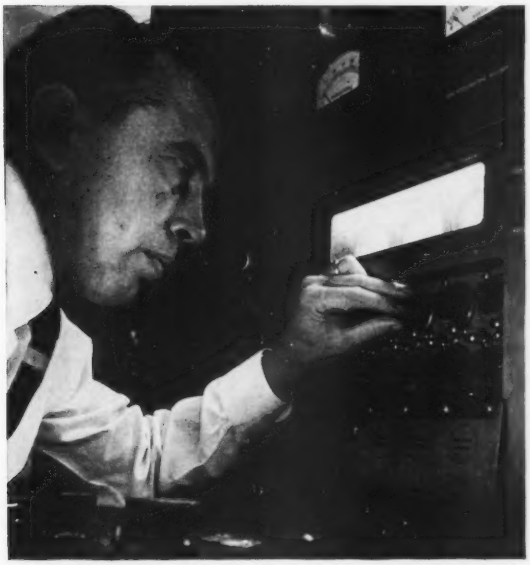
Calvin made public his results in January 1960 at the First International Space Sciences Symposium in Nice, France. In his chemical analyses of the intact core of the Calloway County meteorite, he reported, there were traces of sugar acids, reducing compounds, and other materials that Calvin characterized as "prebiotic," that is, similar to those ancestral chemicals associated with the emergence of life on earth. As Calvin put it: "The samples indicate that the same evolutionary processes that have unfolded on earth have gone on elsewhere."

Nagy and his colleagues (Dr. Warren G. Meinschein, an oil company scientist, and Dr. Douglas J. Hennessy, of Fordham) made their first report in early 1961. They ran minute samples, as small as

four millionths of a pound, from the core of the Orgueil meteorite through a mass spectrometer. Inside the rock were hydrocarbons, compounds containing hydrogen and carbon, the building blocks for all life as we know it. The mass spectrometer heated the sample until the hydrocarbons were transformed to an ionized, or electrically charged, gas. The speed with which the ions struck the collection plate was a measure of the number and distribution of the carbon atoms in the molecules. Each hydrocarbon molecule was found to have an odd number of carbon atom constituents; the numbers 19, 21, and 23 occurred most frequently. This "peaking" is similar to the arrangements found in the so-called waxy, or paraffinic, hydrocarbons—a simple arrangement of hydrogen and carbon atoms found in such earth life as butter and the skin of apples. Here, then, were biotic compounds, materials representing life already formed and functioning. How did these hydrocarbons end up in rock form? The answer is suggested in the process by which coal and oil are thought to have been formed here on earth: organic plant life or animal life grows, dies, and decomposes into peat bogs; it becomes covered with inorganic material due to the earth's movements; eventually it is compressed into seams of coal or trapped as oil in sedimentary rocks.

As with all important discoveries, Calvin's and Nagy's findings raise questions that cannot be immediately answered: Where did the meteorites come from? How old are they? How did the life that they represent make the transition from inanimate matter to life? But, assuming that the chemists are correct in their analyses, and that their samples have been kept uncontaminated, it now seems reasonable to conclude that long, long ago, elsewhere in the universe, life began an earthlike evolutionary climb. As Shapley expressed it: "We have no justification for assuming that long-enduring biological experiments are confined *only* to the surface of this planet which circles an ordinary star out toward the edge of a typical galaxy."

Acting on the new assumptions, the National Radio Astronomy Observatory in 1960 began its Project Ozma. Under the direction of Struve and a young radio astronomer named Frank Drake, the observatory's 85-foot radio telescope near Green Bank, West Virginia, began listening in one tiny arc of sky for any artificial, intelligent patterns that might be mixed in with the natural cacophony of cosmic noise. The first brief sky search produced no results —hardly a surprise considering the immense odds of both time and space. But the observatory is prepared to begin again in the mid-1960's when a new 140-foot dish will be available to scan a larger area of the universe.



Dr. Warren G. Meinschein is shown operating a mass spectrometer in a petroleum research laboratory.

When scientists discovered that they needed mass spectrometers to carry on their research into outer space, they turned to oil industry laboratories.

What use do oilmen make of this complex instrument? The answer is twofold:

1. Gasoline, asphalt, waxes, lubricating oil, and a host of other petroleum derivatives are analyzed by the device. The results aid the continuing research aimed at improving product quality.

2. Samples of rock brought up from oil wells or found on the earth's surface are studied to determine their hydrocarbon content. This work is part of a wide-ranging investigation into the origin of petroleum. Once oilmen can determine the process that turns hydrocarbons into petroleum, they will be better able to find the environments where petroleum exists.

They said it couldn't be done, but Lottie McFann made the grade in a particularly male corner of the man's world.

Lady

THE WIND whipped the beach as the black car rolled to a stop on the cliff above. The woman sat quietly at the wheel for a moment. Then she stepped out of the car and walked toward the mass of twisted metal that had once been an oil derrick.

For the hundredth time Lottie McFann fought against the doubts that assailed her. She had overcome one obstacle after another, but could she recover from this blow? Or had they been right after all, those men who had insisted that she was making a mistake?

At the age of 50, Lottie was sole owner and working boss of the McFann Drilling Company in Long Beach, California. She had been at it for eight years, since her husband's death in 1945. She had managed to keep the business going, even saving enough to buy a new portable derrick. Now the derrick was ruined.

"It wasn't anyone's fault"

"It was there on the ground when I arrived," Lottie recalls. "The boys thought I'd feel terrible—I had to cheer *them* up. It wasn't anyone's fault; they were the best crew in the world. But it was discouraging."

Tens of thousands of dollars were lost in the crash of the 142-foot derrick; but, as often before, Lottie managed to keep the business going. "I prayed and I worked," she explains; and when she retired from active management of the firm two years ago, she did so voluntarily, and at a profit.

Lottie was born in the Salinas Valley of Monterey County, California. As a child she spent vacations with her brother-in-law, who owned an oil company, and her brother, who drilled for him. Lottie went to Santa Cruz with them after the company was sold, and there she learned the millinery business.

The attractive blue-eyed brunette copied original creations from Paris in a wholesale house in San Francisco; she worked for several retail firms, carefully banking her salary; then she opened a shop of her own. But her millinery career ended when she married oilman Bill McFann and went with him to the Midway-Sunset oilfield in Kern County.

Bill had been hired when he was just 16 by W. P. Cunningham, a wildcatter, and Lottie was enthralled by her husband's stories of the industry. She had been fascinated by the oil business as a child, and now she was in it again.

"The greatest thrills of my life," she recalls, "were visits to the wells with my husband after dinner and sitting by the wells in an old pickup truck in the dark, listening to the music of the rotary drill."

The next years were exciting ones for the young couple. Their son, Bill, Jr., was born in 1917. Some of the wells Bill, Sr., worked on came in; many more failed. There were times when Lottie was alone with her child, while her husband followed the oil trail to Oklahoma and Texas and twice to the Argentine. Lottie helped fill the empty hours by taking a business course at a school owned by a woman who had a degree in petroleum engineering. Lottie didn't know it at the time, but her studies were to pay for themselves many times over.

To help Bill realize an ambition to own his own drilling rig, Lottie set herself up in business again. She purchased a large quantity of fireworks in 1942, and the next Fourth of July her well-stocked shelves were quickly cleared. The profits went toward the purchase of a rig, and Bill took in two partners.

Thirteen months later Bill died, and Lottie was on her own. Her husband's partners were not oilmen, and they had no interest in a venture run by a woman; they wanted to sell. Lottie's friends all advised her to go along, to sell out. But Lottie had a strong feeling that her husband would have wanted her to keep the business operating.

The contract was rewritten

She went to a major oil company with whom Bill had had a contract, and she convinced an executive that she could carry on. The contract was rewritten. She needed money to buy out her partners and sought it at a bank; the banker had his doubts about any woman's ability to run an oil drilling firm, but she convinced him, too. Now all that remained was for her to convince herself.

A drilling company specializes in service, efficiency, and speed. Lottie had to find customers for her services, individuals and companies who wanted to take the risk involved in drilling for oil; she had to sell them on the adequacy of the drilling equipment she owned, on the skill of her crew, on the speed with which she could complete a drilling program. She also had to prove that a woman could

y in the Oil Patch

by Duane Valentry

make the grade in what had always been a particularly male corner of the man's world.

Lottie picked up information about the business by asking questions. She made mistakes and learned from her errors. She took specialized courses in such subjects as mud control, electric logging, real estate, and finance. She attended as many petroleum conventions as she could.

Gradually oilmen in the area became accustomed to the fact that "McFann" was a woman. Word spread that Lottie's equipment was dependable; her crew broke several drilling speed records. And above all, it became known that Lottie had a "harmonious" rig.

Lottie's crew became very fond of their boss-lady. She often filled the back of her car with homemade cakes and cookies and passed them among the men when she visited the rig. She placed heavy emphasis on safety practices and always wore a hardhat at the drilling site. But Lottie wore her hardhat with a difference: she trimmed it with flowers, a hearkening back to her days as a milliner.

Around the drilling rig Lottie McFann wore her hardhat with a difference: she trimmed it with flowers.

Each morning, before she went about her business duties, Lottie took time to study the Bible, especially the lives of the prophets; and this gave her a sense of guidance and direction.

"My experiences in the oil business seemed to me similar to those of the children of Israel," she says. "I have had the Red Sea in front of me and the Egyptians in back of me, as it were."

Optimism was required

The problems involved in supervising equipment worth hundreds of thousands of dollars required an optimistic frame of mind: there were so many things that could go wrong. Shortages of critical parts often delayed a project. Sometimes there was no work to be found, and Lottie would spend weeks searching for a customer. She always managed to find one.

Today the McFann Drilling Company is on the inactive list, but not so Lottie. She is a member of several clubs, including the national oilwomen's organization known as Desk and Derrick. She is a leader in the Long Beach Christian Science Church and a member of the local chamber of commerce. And she still operates her fireworks stand each year.

Moreover, Lottie is still very much in the oil industry. She holds a lease on a 40-acre plot of land in Santa Paula, and she has hopes it may be a valuable oil property. She has drilled a wildcat well on the site, and the well produced oil for a short period of time; then the oil turned to water. "It wasn't much of a success," she comments, "but a wildcatter gets used to that sort of thing."

Lottie conducts her business in the large kitchen of her pink stucco home in Long Beach. She relaxes in a living room filled with *objets d'art* from the Orient, sent by her merchant marine son.

There are two other items worthy of note in Lottie's parlor. The first is a small perfume dispenser in the form of an oil well, a memento of a television program on which she was honored. The second is a painting of Daniel in the lions' den. During her early years as a lone woman in the oil patch, Lottie explains, she has gained considerable comfort from this painting.

Twin Parks

A revolutionary concept in highway service may lead to a new kind of community.

MASS TRANSPORTATION is commonly thought to denote the so-called "common carriers" —generally, the ships and trains and planes that move millions along appointed routes. Today another candidate is being considered for membership in the mass transport class: the National System of Interstate and Defense Highways.

This 41,000-mile, $41 billion network cannot be thought of as "just another road," the planning experts insist. In their terms, it is a "superpipeline" of traffic and a channel for the movement of masses of vehicles. And it presents very special problems and opportunities.

An obvious problem is the provision of service facilities. The nature of the auto and its occupants requires frequent stops for care and feeding. Out of this problem arises an opportunity for American business.

The Interstate Highways are limited-access roads; that is, the number of exits and entrances is kept to a minimum. In addition, commercial facilities are not permitted on the rights-of-way. This arrangement enables the traffic to flow efficiently and safely.

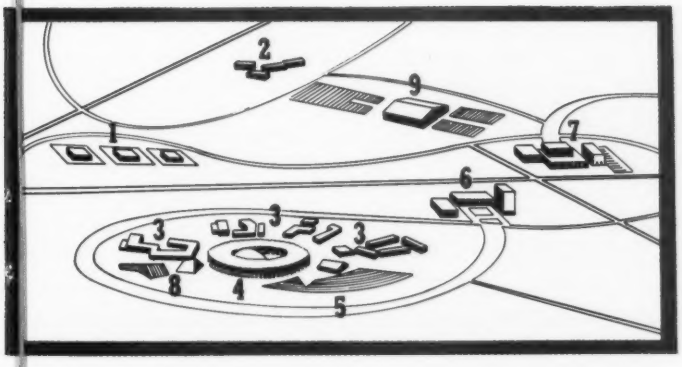
How, then, are the needs of the motorist to be met? In many cases, already-existing motels and service stations on roads close by the highways can do the job; new facilities are being constructed along roads leading up to highway interchanges. But in some parts of the country new and radical solutions are being found. Twin Parks, Ohio, is in this category.

The site of this development is a four-square-mile tract located on private property bordering both sides of Interstate Highway 71 between Cleveland and Columbus. As envisioned, Twin Parks will be a $75 million project consisting of two matching complexes of facilities, one on each side of the highway. Some of the facilities planned: Motor lodge accommodations in various price ranges; a variety of eating places, from snackbars to fine dining rooms; service stations and auto supply centers; truck terminals and freight storage areas; a station for intercity and interstate buses; large parking areas—PLUS recreation areas for bowling, skating, swimming, badminton; a central pedestrian core with general stores and specialty shops; a theater-chapel; facilities for conferences and conventions—PLUS an office building and provision for industrial research and manufacturing operations.

J. Marshall Miller, a member of the faculty of the Columbia University School of Architecture, designed Twin Parks; a group of Cleveland businessmen is developing it. Professor Miller looks upon the project as only the first in a series of such developments along the Interstate System. He calls them "motorparks."

"A motorpark," the professor says, "provides total service. It takes all of the various elements

Key to artist's conception of Twin Parks, Ohio



1. Service stations. 2. Motor inn and conference site. 3. Other lodgings. 4. Pedestrian core with general stores and specialty shops. 5. Recreation areas (bowling, skating, etc.). 6. Office buildings. 7. Civic center. 8. Theater-chapel. 9. Convention hall.

which serve the motorist and groups them together as an integrated, planned, and attractive entity." Twin Parks is unique in terms of its scope; most of its individual features have been tried and proved at such motoring centers as those at Sun Valley, Idaho, and Canyon Village, near Yellowstone National Park.

Professor Miller expects that the Ohio travel center will eventually become a complete community, that the highway will attract industry that will attract a labor force that will build homes on the periphery of the motorpark.

He sees the development as part of a larger historical panorama. "When the nation was first being settled," he says, "the pioneers cut trails through the wilderness, and the early villages grew up along these trails. Navigable waterways served the same function; so did the railroads—their use paved the way for the towns and cities we know today. The new highways, such as the Interstate System, are part of this tradition. I believe that the new communities of the future will spring up along these latter-day trails."

Thus Professor Miller sees Twin Parks as more than a single enterprise—as a preview of things to come.

The men of the U.S. tanker fleet have damned the torpedoes and ignored raging storms to heed the call of distress.

Rescue at Sea

by Tom Allen

THE U. S. NAVY seaplane wheeled in at masthead height, buzzed the tanker, and veered off. Instinctively, the men on the bridge ducked. As they looked up again, they saw something tumbling from the plane. The object, a weighted canvas pouch, landed at the feet of the second mate.

In the pouch was a penciled note: "Disabled plane on water 06°03′ North, 86°10′ West, bearing 060° true from Cocos Island at distance of 65 miles. Proceed and give assistance."

The downed plane, a patrol bomber, was miles off the tanker's course. In those tense wartime days that meant extra miles of stretching your luck, of exposure to the submarine packs that stalked Allied ships—and tankers most of all.

But the message that landed on the bridge of the tanker *Little Rock* was based upon a proud tradition of the U. S. tanker fleet: When you need help, you can count on a tanker.

The *Little Rock* upheld the tradition. She reached the reported location of the plane in 10 hours, arriving at 1 a.m. on a black night. There was only one way to find the plane crew. The *Little Rock* stopped dead in the water and probed the dark seas with her searchlights. She was lucky; she found the eight airmen before a submarine could find her.

The casualties were high

Rescues by tankers are common at sea because a tanker usually can answer a distress call first—and with equipment adequate to do the job. As she races to a rescue, a tanker carries substantial quantities of first aid, firefighting, and rescue equipment. Because of her speed, a tanker can get where she's needed in a hurry. And her crew, attracted by good pay, steady work, and the finest living conditions afloat, traditionally is picked from the best men the merchant marine has to offer. Many crewmen are veterans tempered by the Battle of the Atlantic, when U-boats were sinking tankers as fast as they could be built. One out of every six tanker crewmen died at sea—until the very oil the tankers carried helped turn the tide of victory.

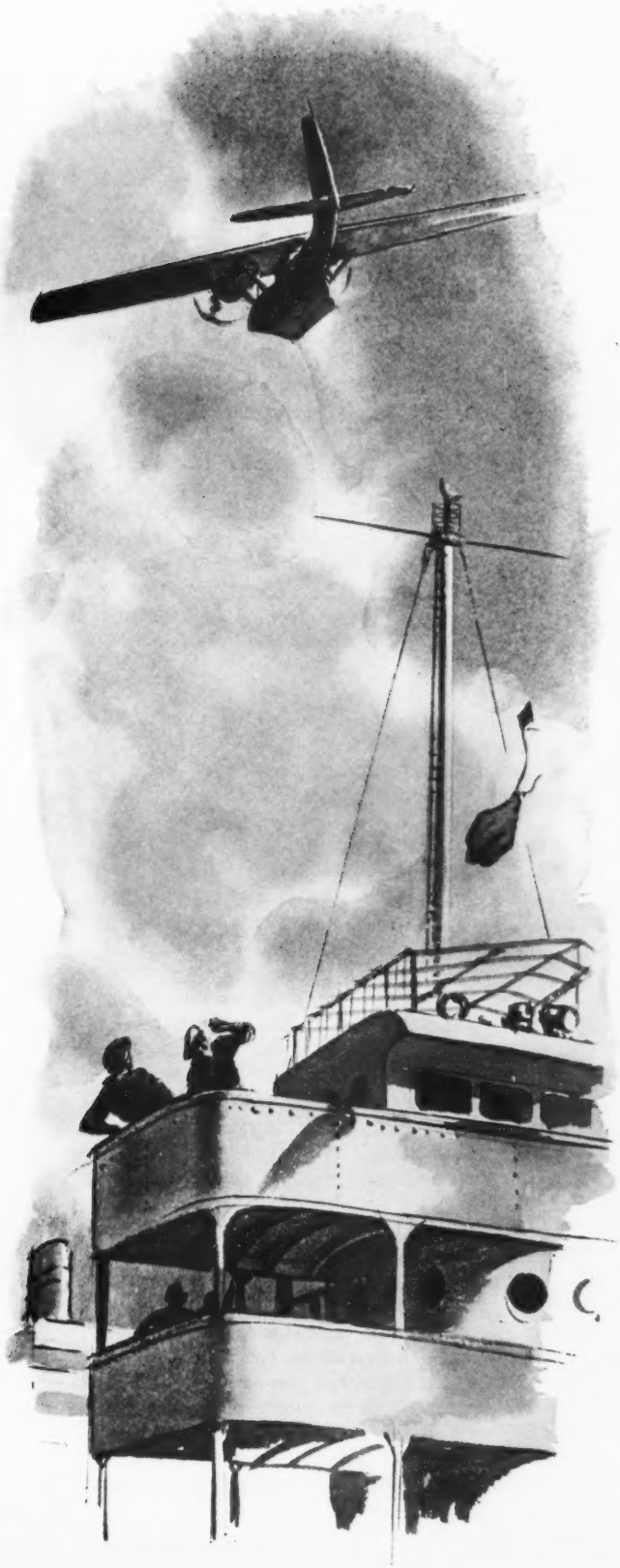
Tanker crews are skilled in basic seamanship. For example, they have a reputation for fast turnarounds; they get their ships in and out of ports speedily. Thus on any day or night most of the more than 300 ships in the U. S. commercial tanker fleet are at sea, available—and well prepared—to handle any kind of rescue.

The seaman couldn't swim

The cryptic entries in tankers' logs underplay the drama and the coolly courageous deeds behind many rescues. Reporting how a seaman made his way down a rope ladder to tie a line about a man in the water, a tanker master remarked that he had not known the seaman couldn't swim "until he had informed us of the fact after he came back on deck." Another tanker's log notes that during one rescue several crewmen in life jackets leaped over the side and tied lines about the victims who were then hauled out of the water. This method was necessary, the master laconically explained, because the seas were too rough to lower a lifeboat.

"At 1810 this same day," says another routine report from a tanker master, "the chief mate informed me of an unusual flaring light off the starboard bow. . . ."

This day, or rather this dark and silent night, was Christmas Eve. The strange light on the eastern horizon came from a 36-foot cabin cruiser. Aboard her were two men, a dog, a burro—and little hope. They had been adrift for five days. Their drinking



water was gone. They had used all their signal rockets. Now they soaked some clothing in kerosine, wrapped the rags around venetian blind slats, lit them, and waved their flickering flares. They knew there was little chance of their feeble signal being seen.

But a tanker was there. She pulled alongside and hauled the men and dog aboard. The burro could not be lifted up to the tanker; so a towline was made fast to the boat. Just after midnight a Coast Guard cutter arrived and took the boat in tow. As Christmas arrived aboard the tanker, crewmen apprehensively watched the cutter, the foundering boat, and the shivering burro begin their voyage to shore.

"Boat has considerable damage," the Coast Guard radioed the tanker the next day. "But burro appears in good condition."

The boat was adrift

A modern supertanker carrying enough crude oil to fill as many as 1,411 standard railroad tank cars often rushes to the aid of a motorboat that has run out of gas. Tanker masters know, however, that these seemingly easy rescues are often the most difficult. One day last fall the tanker *Communicator* spotted a 14-foot boat drifting in high seas off the Connecticut coast. The *Communicator* maneuvered alongside the boat and threw a line to the boat's sole occupant. But the man was too weak to grasp it.

Captain E. A. McGowen ordered the midship boom rigged. Boatswain Lawrence Jacques was tied to a line from the boom and lowered to the boat, which was bobbing on seas churned by strong winds. Jacques freed himself from the boom and quickly fastened a line to the boat. After the battered boat was eased into the sheltering lee of the 30,000-ton tanker, the boom swung out again, this time lowering a ladder, to which Jacques lashed the semiconscious boatman.

The man was lowered gently to the tanker deck, and skilled hands immediately began tending him. His legs were partially paralyzed, apparently from being cramped during the 25 hours he was adrift. Circulation was soon restored by a brisk massage. A few hours later, in warm clothes (and with a loan of enough money to get home, by train), the man was transferred to a U. S. Coast Guard boat, which took him to shore. "Captain McGowen and his crew will always sail with our prayers," the man's wife wrote in the kind of thank-you letter that frequently follows in a tanker's wake.

Tankers save ships, too. Once, during a Cape Cod Bay blizzard, the SS *Frank Haskell* sped to the aid of a tug that had apparently lost its rudder. When the *Haskell* arrived, a Coast Guard cutter was fighting through 70-mile-per-hour winds to secure a towline on the erratically coursing tug. The *Haskell* pumped oil on the water, calming the swells long enough for the cutter to make her towline fast. As

A friend in need

Thomas H. Blondell, Jr., and a friend were out boating on a winter afternoon when their small craft developed engine trouble. By nightfall they had drifted 25 miles out into the Atlantic Ocean, and matters were becoming desperate. Then they saw the lights of a ship in the distance, they signaled with their spotlight, and the tanker *Oklahoma* came to the rescue.

It was standard operating procedure for the tanker and for the oil company that owned the ship—until Blondell opened his wallet and showed Captain H. S. Parsons his gasoline credit card. The trade name on it matched the company name on the bow of the ship.

Blondell praised the seamanship of the captain, who had been able to swing the huge tanker around to aid the small boat without damaging it. And he had a few words for the company whose credit cards he and his business firm used. "We will continue to keep them in force," he said, "from this day forward."

the cutter began towing the tug into port, the storm knocked out the radar on both ships. Both ships were blind, but they could hear, for their radios still worked. The *Haskell*'s radar became the eyes for all three ships. In an outstanding display of navigation, the *Haskell* conned the other ships by her radar fixes, shepherded them into the refuge of Provincetown harbor, then followed them in.

During World War II the tanker *Cedar Mills,* skippered by 27-year-old Morgan A. Waxey, saved the French destroyer *Le Triomphant,* which was escorting the *Cedar Mills* from Australia to India. Halfway to India, *Le Triomphant* ran out of oil. The tanker tried to refuel her, risking almost certain collision because *Le Triomphant,* powerless, rode the sea like a cork. The fuel lines parted, and the ships grazed each other, though without serious damage. Waxey tried to tow the destroyer; the line snapped in the mountainous seas. He tried again to refuel her, using fire hoses as fuel lines; they snapped. It was no use. *Le Triomphant*'s captain ordered his crew to abandon ship.

The *Cedar Mills* spread oil upon the water and, in this fast-vanishing calm, got away two boats. In two valorous trips, 125 men were transferred from *Le Triomphant* to the tanker. Crewmen from the tanker went over the side to pull French sailors from the sea; riflemen on the heaving deck of *Le Triomphant* picked off menacing sharks. A stout line was strung between the two ships, and across it the tanker passed enough food and water to maintain the men who stayed aboard *Le Triomphant,* desperately trying to keep her afloat. The fight against the sea went on for nine days and nights, and Waxey never left the bridge. Finally, a cruiser arrived and took *Le Triomphant* in tow. She was saved.

The tanker *M. E. Lombardi* once used 100 pounds of sand, two sacks of cement, 100 square feet of canvas, nails, lumber, and a Japanese-speaking third mate to save a Japanese ship that was sinking in the middle of the Pacific. *Toyama Maru* was flying the International Code signal flags "P" and "Q" ("I have sprung a leak and need immediate assistance") when the *Lombardi* reached her side. With the *Lombardi*'s supplies, and know-how, a collision mat and cement "patch" were made to plug the hole in the ship's hull. The *Lombardi* stood by on this rescue mission for two days. As a result, she could not reach her destination, California, and had to make port in Honolulu to refuel.

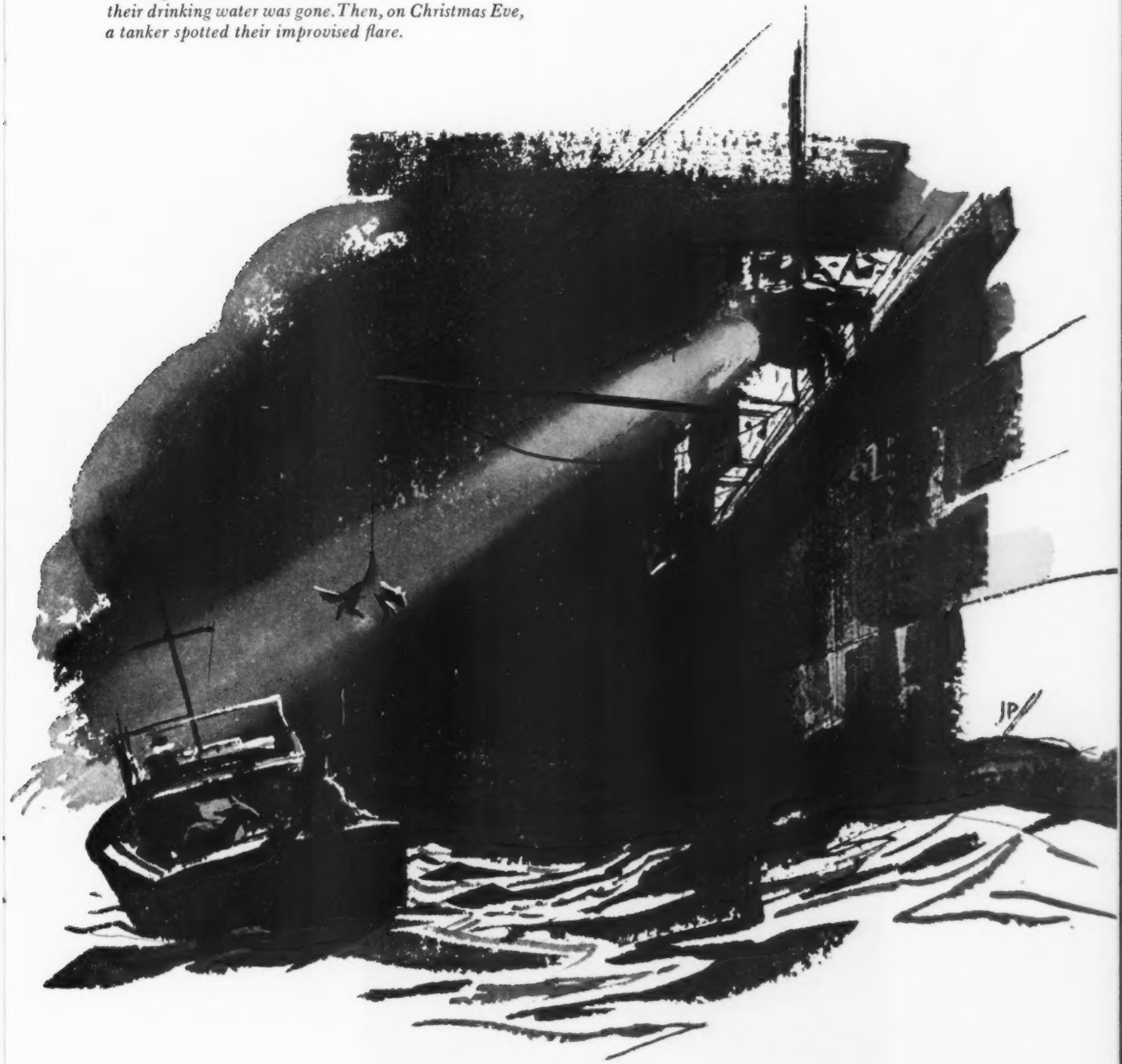
Delays such as this are not unusual for tankers. Within eight days recently, four tankers of one company's fleet answered calls for aid off the Florida coast. But, because tankers are fast, they can usually perform errands of mercy without getting far behind schedule.

Even in port, after making a delivery, a tanker sometimes answers an S O S. When lightning struck an electric substation at a refinery, for instance, a tanker was transformed into a powerplant. Her pumps were hooked up to the water system ashore so that pressure would be available for firefighting.

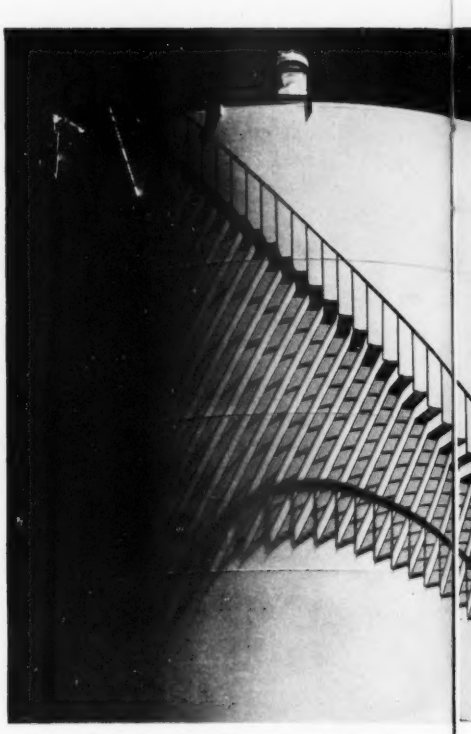
The gallant deeds of tankers have long gone unsung. Since 1954, however, the outstanding feat of the year has been recognized in the form of the Ship Safety Achievement Award, presented jointly by the American Merchant Marine Institute and the Marine Section of the National Safety Council. The award—symbolized by a pennant the ship flies for a year—is given in three categories: Dry cargo ships, passenger liners, and tankers.

Usually the pennants are presented in impressive dockside ceremonies attended by the winning ship's captain, officers, and crew, representatives of the ship's owners, and the awards committee. At least that's the way the pennants are given to the winning passenger liner and dry cargo ship. But because tankers turn around in port so swiftly—or are forever saving somebody in some unpredictable rendezvous—most of the time the awards committee just gives up trying to arrange a ceremony for the tanker and mails the pennant to a likely port of call.

Hope had run out aboard the cabin cruiser.
Two men, a dog, and a burro had been adrift for five days;
their signal rockets had not been seen;
their drinking water was gone. Then, on Christmas Eve,
a tanker spotted their improvised flare.



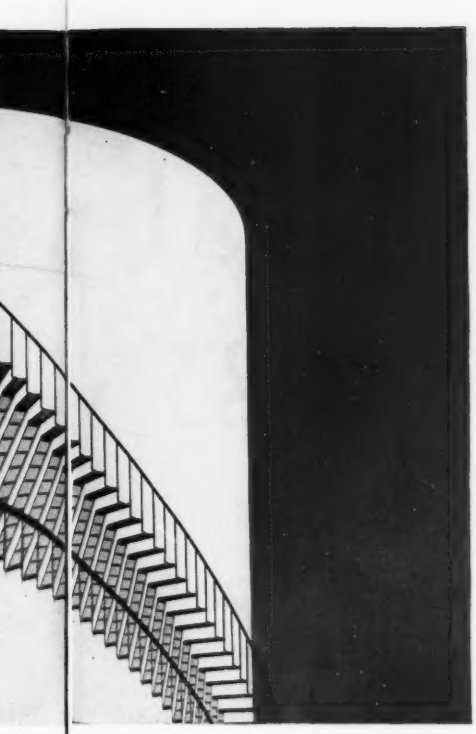
C. F. Moseley, an oil company executive, prepares to feed "Suzie" as a coworker looks on. Moseley first became acquainted with the alligators of Bayou Choctaw, Louisiana, during a drilling operation in 1941. Now he has a whole "family" that comes out of the water at the sound of his voice.



Sun and shadow paint geometric pattern up- on a natural gas storage tank. Such facilities

Dr. Dwight Prater (left) and Dr. James Wei have made an important contribution to scientific knowledge of molecular action during the course of research into oil refinery operations. The three-dimensional mathematical model (left) they developed to increase refinery efficiency is based upon the unprecedented application of linear algebra.

P. M. Walters fires a rocket gun as part of a night survey to "fix" the location of an oil drilling site in the Gulf of Mexico, 31 miles off the Texas coast.

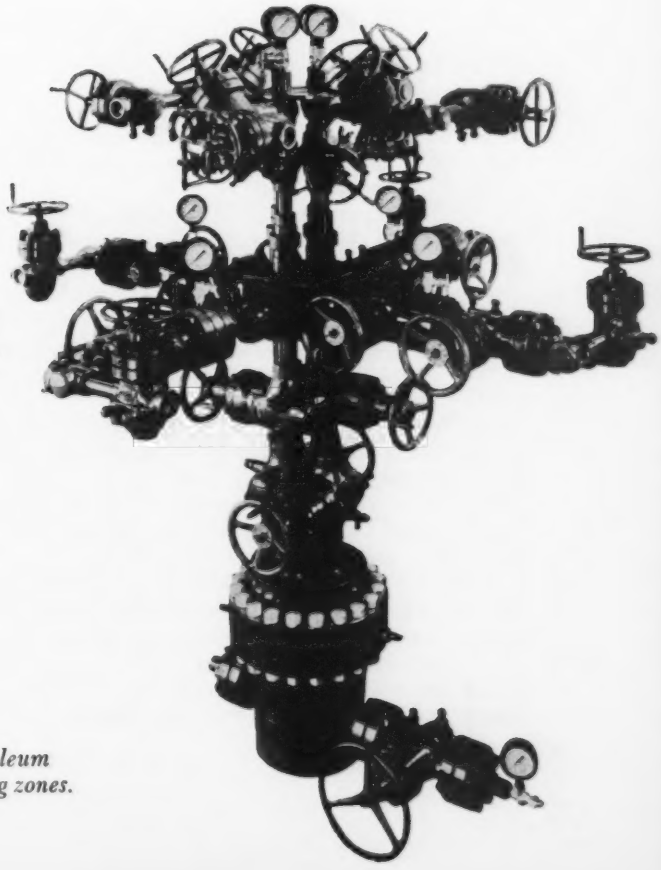


ern up-
acilities

enable the industry to keep a supply of readily available fuel for public needs.

Petroleum Potpourri

A kaleidoscopic portrait of the American oilman and his industry.



This maze of dials and valves sits atop an oil well and controls the flow of petroleum from the several underground producing zones.

Inside Industrial Psychology

by Charles Paul Sparks

The public views the increasing use of psychology in industry with suspicion and skepticism, says a leader in the field. He tells of his personal experiences: Goals, techniques, and results.

The cartoon showed a husband and wife seated at the dinner table. "Martha," the husband was saying, "I took an aptitude test today. It's a good thing I own the company."

I saw this cartoon in a national magazine while on a flight to a Midwestern city. It was appropriate: my assignment there was to interview the employees of a company in connection with an attitude survey.

The next day one of the men I was interviewing showed me another magazine cartoon. Two tape recorders were represented as talking to each other—one in a chair, the other on a couch.

Fifteen years ago, when I became an industrial psychologist, such cartoons would have had little meaning to the general public. Today industrial psychology has obviously arrived as part of everyday life. Yet sometimes my colleagues and I are forced to look upon this new recognition as a mixed blessing.

On the one hand, the industrial psychologist is viewed with suspicion, as a scientist who somehow manipulates facts and statistics to the detriment of the worker. On the other hand, he is looked upon as nothing more than the apostle of "commonsense."

What, precisely, is this contradictory creature?

He comes in a variety of shapes and sizes. He may be a staff specialist in the employee relations or industrial relations division of a business. He may be a consultant, on his own or with a consulting firm (as I am). He may be on the staff of a university and be a consultant on the side as a means of adding to income or putting theory into practice.

The industrial psychologist may work with individuals—interviewing, testing, training. He may specialize in work with organizations—surveying opinions and attitudes, developing pay and incentive systems, studying relationships between work conditions and production output. His credo: the successful, satisfied employee in the right spot will do the best job.

Helping the employee, and the employer, to achieve this goal is my business. How do I go about it? By using every bit of experience and knowledge available to me, and that includes both the scientific tools of my profession *and* commonsense.

My business has carried me to all parts of the country and has involved me in a variety of different industries, but particularly in the oil industry. Here are some examples of the problems I've faced and the techniques I've used to help solve them.

The management of a refinery followed the policy of promoting from within. They were searching for a means of selecting the best potential foremen from among their nonsupervisory employees.

CHARLES PAUL SPARKS *has been a practicing psychologist for 25 years. He is an officer of Richardson, Bellows, Henry & Company, Inc., management consultants.*

The first step was to contact a group of 500 supervisors. We asked them if they would agree to take a series of tests dealing with various aspects of supervisory work. They agreed to help us.

Next we developed the test questions. A special committee of company personnel, including several who had had experience as foremen, worked with us. The object was to find questions appropriate to the particular company situation.

We ended up with a battery of tests ranging from one dealing specifically with supervisory judgment to others covering mechanical aptitude, personal background and interests, arithmetic reasoning, and general intelligence.

The supervisory-judgment test contained such questions as the following: Most employees feel that the best supervisor is one who (A) is "one of the boys," (B) is fairly friendly, (C) doesn't get personal, (D) is "all business." The persons taking the test indicate the best and the worst of the possible solutions offered.

The personality inventory included questions such as: I like to spend my off-time hours (A) hunting, (B) watching television, (C) reading.

After the tests were given, the company selected from the group of 500 volunteers those it considered to be most successful and least successful as supervisors. We picked out those groups of questions on which the successful supervisors did well and the unsuccessful did poorly. And the final test was made up of these "proved" questions.

How effective was this testing program? Soon after it had been evolved, the final battery of tests was given to 250 candidates for supervisory positions. Fifty of the best qualified were promoted; their qualifications included, of course, the personal judgment of their supervisors and their seniority. A year later it was found that more than 90 percent of this group of test-selected foremen had performance ratings above the average of those who had been promoted to foremen before the testing program was instituted.

As you will note, the definition of success — of how to define a "good supervisor"—is crucial. In this case, the performance ratings were used. In the case of a test aimed at isolating those traits that made for a successful service station dealer, we tested our tests by giving them to already-established dealers and rating the dealers by the quantity of gasoline and other products they were able to sell.

A good part of my time during the past 15 years has been spent talking with individual workers, conducting surveys to discover their worries and complaints: Interviewing and fishing at an offshore drilling rig in the Gulf of Mexico; sitting with the night operator at a pipeline pumping station in Mississippi while the coon dogs worked their way around the circle; drinking black chicory coffee made with live steam at a refinery in Louisiana.

I've probably enjoyed my survey work more than any other part of my industrial psychology practice, mainly because of the attitudes of the people I've met. And I might add here that I cannot agree with those who impugn the sincerity and willingness of today's worker—whether he's a gangman cutting weeds from a pipeline right-of-way or a Ph.D. juggling test tubes in a research laboratory. He may not always know the solution to his problems; he may be inclined to put the blame on an amorphous "they"; but if he is given the facts, if he once understands the situation, he does the magnificent job he has always done.

Personal opinions aside, I have found that a large percentage of so-called morale problems stem from a breakdown in communications. Several years ago I was called in by a pipeline company that was in the midst of a periodic program aimed at upping its efficiency. The employees were aware of the importance of the program, and they were also aware that it would entail a reduction in the work force.

The company feared that there would be a sharp slump in morale, that its total operation would suffer, that employees who would not actually be affected by the efficiency program would leave the firm.

We interviewed 10 percent of the employees, on all levels, male and female, with from two to 30 years of service with the company. What were they most worried about?

Surprisingly enough, they were not concerned about being laid off in an arbitrary manner. They had faith that the company would give them a fair shake. But they *were* worried about how the changes in the operation might affect their particular duties. And they wanted to know how the company would handle the benefit plans for those who were let go.

The company moved rapidly to answer these questions. And morale remained high; efficiency was not affected; and many of the better employees, those

with "get up and go" who might have left, chose to remain. Certainly the action taken as a result of our survey was not solely responsible for this result, but it helped.

As a contrast, I remember a textile company that was considering using our services. The company had two plants, and one was much more efficient than the other. In the problem plant the focal point of trouble was one department with a high absentee record, a high spoilage record, and a high materials wastage record.

I found that there were 24 women in the department. Twenty-three of them rotated between day and night shifts. The one woman who never had to take a night shift was the wife of the foreman of the department.

Obvious? No question about it, but the company's management hadn't seen the situation nor several other similar situations affecting worker morale. I proposed a consulting arrangement to work out some of these problems, but the company decided it couldn't afford the fee.

Apparently it considered such matters as morale and employee communications to be frills.

Perhaps the corner of my work, and that of my colleagues, that creates the most public confusion and consternation is testing involving employees' personal feelings and personal lives. What business do we have, you might ask, with a man's preferences between hunting and fishing? Why should we ask, as I have asked, about the type of relationship among the members of a man's family?

The answer is that we are interested in helping companies to arrive at decisions that will be best for everybody—for the employee as well as the company. And under certain circumstances this requires that we know something about an employee's personal background and interests. For example, I think of a company that had a job open in an isolated corner of the world; the man who took the position would be alone there, with his family, for weeks at a time. We knew that a family that found most of its enjoyment within the family circle would be better able to adapt to this situation than a family whose members normally went outside the family circle for their recreation. If we had not chosen a man for the job with this in mind, the company would have been in trouble—and the man chosen would most likely have been a most unhappy worker.

Why should a company care about an employee's motivations? I think of the inland barge company that during the depression decided to hire large numbers of topnotch men who were out of a job. When the depression ended, the men left. The nature of the work on the barges had not been sufficiently challenging. If the company had taken the trouble to understand these men, it would never have hired them in the first place.

Why should a company delve into an employee's personal history? Doesn't this reflect a desire to have all employees conform to a special kind of stereotype? The truth is that industrial psychologists and the companies they serve don't care whether an employee was president of his home room or captain of the bowling team; we are looking for evidence of past success and adaptability. Again, the goal is the right man for the right job.

As I look back over my years as an industrial psychologist, I have two regrets. The first is almost inherent in the work of a consultant. Contracts have a beginning and an end, and it is difficult to conduct long-range research. The second regret is more tragic. I have generally been employed by companies that have the least need of my services: the petroleum firms I have cited, for example. Perhaps one reason why they lead the field in employee wages, benefits, and job satisfaction is that they employ people like me to keep them abreast of things—not just to help them catch up.

HURRICANE

Some tropical storms become hurricanes; some don't. Research underway may enable scientists to tell the wolves from the sheep.

by ERNST BEHRENDT

CARLA WAS not a lady. She roared out of the Gulf of Mexico on September 11, the fiercest hurricane of the century, cutting a 500-mile swath of destruction along the coastal plains of Texas and Louisiana.

But the Gulf Coast had known she was coming, and she was a slow storm. There was time to evacuate the coastal population; thousands of lives were saved. The damage to homes and to industrial property, however, was enormous. Offshore drilling installations, for example, counted losses upwards of $1 million. Cotton and rice farmers anticipated losses of 100 times that amount.

Some recent hurricanes have caused more than $1 billion damage. One of them dumped 20 billion tons of rain on the land. Personal experiences, many of them tragic, have made hurricane statistics terribly meaningful to millions.

What can be done?

Fishermen, housewives, Government agencies, farmers, and countless others want to know whether there is anything that can be done about hurricanes. Can science prevent a hurricane? Can science push it away? Can science predict its coming?

The answer to the first two questions seems to be "No." There is no birth control for hurricanes. Killing a hurricane appears impossible. This is something well-meaning laymen often find hard to understand. They swamp the Weather Bureau with helpful suggestions. Inventors' antihurricane devices have ranged from aerosol bombs to atomic bombs.

Why couldn't a powerful blast upset a hurricane's dynamics?

"Because," says the Weather Bureau, "this would be rather like trying to enforce a 'No Smoking' sign on a volcano. A hurricane is higher than Mount Everest, wider than the State of New Mexico."

Couldn't an atomic bomb destroy a hurricane?

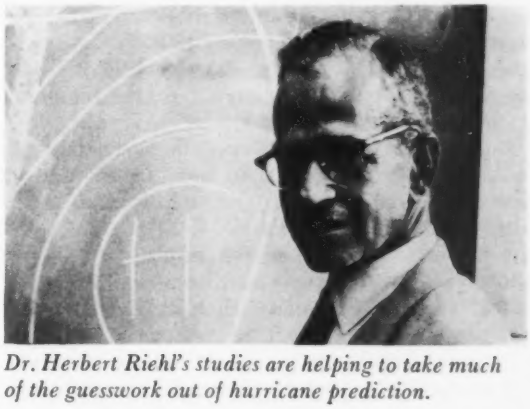
"Hardly," says the Weather Bureau. "That would be like stirring a maelstrom with a soupspoon. A hurricane releases as much energy as several atomic bombs each *second*."

Couldn't hurricanes be calmed down by seeding their clouds with dry ice or chemicals? It has been tried before, hasn't it? Again, the Weather Bureau is skeptical: "To calm down a hurricane would require a tranquilizer the size of Texas."

In 1947 dry ice was used on a hurricane off the Georgia coast. The experiment had an effect: It split the hurricane in two, but one half went on to cause flood damage to Savannah. The effort is considered inconclusive or a failure by most experts.

On September 16 of this year scientists seeded Hurricane Esther with silver iodide, a chemical normally used for rain-making. The hope was that the seeding would bring about new winds within the hurricane that would rip the storm apart or make it change its course. The experiment failed.

But even so, hurricane fighting is no lost cause.



Dr. Herbert Riehl's studies are helping to take much of the guesswork out of hurricane prediction.

If you can't meet the monster head on, you can try to sidestep it. This is why prediction of a hurricane's coming and its path is so important.

The Weather Bureau has set up an elaborate forecasting system. The giant storms are spotted and tracked on radar screens, pierced by planes, followed by radio-equipped balloons released in the hurricane's "eye," analyzed by electronic computers.

This system has saved many lives and averted much damage. It does not yet, however, represent a sure-fire method of predicting exactly when and under what circumstances a mere tropical disturbance with its wild but unorganized winds will develop into a hurricane. Nor does the system provide a completely accurate prediction of the path the hurricane will take.

Among those who are seeking answers to these problems is the nation's oil industry. Some individual companies started enlisting private weather researchers as early as 1949. Then the industry as a whole took an important step into the picture.

Handbook on hurricanes

In 1954 the American Petroleum Institute organized its Advisory Committee on Fundamental Research on Weather Forecasting. The committee formed a Hurricane Panel. It also commissioned a leading meteorologist, Dr. Herbert Riehl—then professor of meteorology at the University of Chicago, now program director for atmospheric science at Colorado State University—to prepare a "working handbook" on hurricanes.

The results of Dr. Riehl's work have been startling. They represent a vital contribution to our knowledge of what makes a hurricane; even more, they actually seem to have taken much of the guesswork out of hurricane prediction.

His key contribution has been a list of "hurricane criteria," intended to help the expert tell a tropical storm from a hurricane, just as a knowledge of the symptoms enables a doctor to tell a harmless rash from scarlet fever. First, he applied these criteria on paper to potential hurricanes of the past; his score in predicting whether they would become actual, full-fledged hurricanes was nearly perfect. Then last year Dr. Riehl had a chance to try his technique on an actual storm; it worked.

What is a hurricane? It is defined as a cyclone with winds above 75 miles an hour. Distinguishing between a tropical storm and a hurricane, then, would seem to be fairly simple. But the problem is, the maximum velocity of the winds is often not known. Observation posts have been so widely scattered, says Dr. Riehl, that "whole hurricanes could easily have moved through an entire ocean without detection." Another problem is the speed with which a storm can turn into a hurricane. An observer can-

A drilling rig in the Gulf of Mexico is dwarfed by the vast expanse of sea and sky. Such rigs are particularly vulnerable to Gulf hurricanes, which have aggravated the shaky economics of offshore drilling. (An investment of more than $3 billion has, in 16 years, yielded participating companies just over $725 million.)

not afford to turn his back. "Hurricane winds develop explosively within a few hours," Dr. Riehl says.

To determine whether a storm will turn nasty, it is necessary to understand the triggering mechanism that does the job. Before Dr. Riehl began his oil-industry–sponsored study, these conditions were thought to be necessary: An airmass of high temperature, with a high moisture content, must be located over a tropical ocean; the airmass must be able to rise unimpeded to 20,000 feet or more (there must be no cold low-altitude airmass to impede the rise).

Dr. Riehl had no trouble confirming these facts. But he needed more. Warm, humid air overlies tropical oceans almost every day of the hurricane season; yet hurricanes do not form every day. Violent rain squalls are common; so are atmospheric lows, depressions, storms. But the puzzle remained: What is it that makes tropical storms "go wrong"?

Look skyward for clues

Years ago weathermen began to pay less attention to meteorological phenomena near the surface and started looking skyward for hurricane clues. They were fascinated by their discovery of giant ripples in the steady flow of the easterlies, the trade winds blowing from east to west. Then they discovered that the westerlies, flowing from west to east at great height, have a similar undulating motion.

The distance from one great wave of air to the next was found to be approximately 3,000 miles.

The trades and the westerlies flow in opposite directions, one above the other. Where they overlap, wouldn't their interaction at times create an airmass with low density? And wouldn't strong winds flow in from all sides, converging near the center and setting up a vortex, a hurricane in the making?

Such a disturbance at 30,000 to 50,000 feet was probably necessary for a hurricane, Dr. Riehl said, but it probably was not sufficient by itself.

All of this was still theory—disputed by some experts, confusing to many laymen.

Working backward and forward, analyzing biographies of hurricanes long dead and studying the life histories of newer ones, Dr. Riehl separated the incidental from the essential. He discovered new facts and reemphasized old ones. And again and again he was made aware of the almost incredible size of a hurricane system and its spreading roots. In spite of its tremendous energies, a hurricane does not travel under its own power. It lies embedded in a wide airflow, a "steering current" that carries it along.

What happens to a hurricane in the Gulf of Mexico—and even whether there will be a hurricane in the Gulf—is often decided by shifting atmospheric pressure between New York and Chicago. There must be, according to Dr. Riehl, winds at 3,000 to 10,000 feet blowing toward a center at two knots or more. There must be winds blowing tangentially to the disturbance at .5 to 1 knot or more. The height of the disturbance must extend to at least 40,000 feet.

The list is long and highly technical. It contains about 20 criteria. They are to be applied to two sets of circumstances: Either to a storm whose center is known, or to a disturbance that is just brewing. In the beginning Dr. Riehl had hoped to reduce the borderline cases—the ones that could either turn into hurricanes or remain tropical storms—to 25 percent of all disturbances. Then he found, not at all to his surprise, that use of more data from distant observation posts helped him to do better.

The record to date

This is his record: Applying his hurricane criteria to all known meteorological facts about potential hurricanes from 1948 to 1959, he could tell the sheep from the wolves in 40 out of 41 cases; he "overforecast" one, as he puts it, by making a storm into a hurricane—all this on paper.

Then, in September 1960, came Hurricane Ethel. She formed extraordinarily fast and developed into a hurricane of high intensity.

Before anybody could be sure that there would be an Ethel, the private weather forecasting service of A. H. Glenn and Associates in New Orleans studied weather reports and Riehl's criteria. Then they came up with a forecast. It was accurate. Hurricane Ethel materialized as predicted, and she was just as vicious as expected.

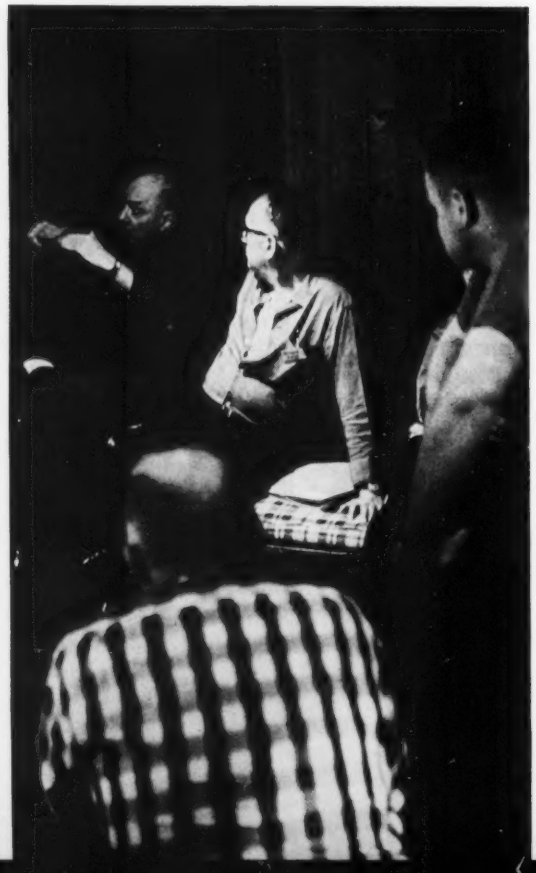
A full season of operational study of Dr. Riehl's prediction techniques is now being considered. Under the plan, information on developing storms would be programmed into a specially prepared computer. Out of the computer would come the hurricane forecasts, which would then be compared to the actual event. The results of such tests may represent an important step forward in man's battle with the hurricane.

Mercer H. Parks, an oil company engineer, is chairman of the American Petroleum Institute committee working with Dr. Herbert Riehl. Parks uses these Japanese umbrellas to explain the conditions necessary for the formation of a hurricane.

by Edward McGrath

Sunburn Seminar

Conference-bound businessmen are going back to nature with a vengeance. What takes place at these meetings far from the madding crowd? A case history.



AMERICAN BUSINESSMEN are heading for the hills each summer in search of a blend of fresh air and fresh ideas. Attaché cases and sales charts in tow, they're converging on rustic retreats safely insulated against jangling telephones and the eroding bustle of daily business.

There was a time when industry seminars were held at metropolitan hotels, college campuses, or not at all. Today, in ever-increasing numbers, businessmen are learning the merits of trading opinions and ideas over a whipping fly rod or a dipping canoe paddle.

How do these "sunburn seminars" work? What do businessmen do when they get away from balance sheets and delivery schedules? Fairly typical of the phenomenon was a gathering this summer at Blue Mountain Lake in the Adirondack Mountains. The participants: 21 jobbers, men who purchase petro-

Undisturbed by the day-to-day demands of their businesses, the conference participants discussed common problems in an atmosphere of informality—whether on a lakeside pier (above) or in their rustic quarters (left).

leum products from refineries and then distribute the products to service stations and heating oil accounts. The sponsors: The Empire State Petroleum Association (ESPA), of which they are members, and Syracuse University. The purpose: a four-day management conference.

The registration presented a good cross section of the nation's 15,000 gasoline and fuel oil jobbers. As middlemen, they distribute petroleum products to retailers—service stations and fuel oil dealers. In some cases the jobbers own or lease the retail businesses they supply. One "student" owns two service stations; another manages 165 stations and a heating oil business. Their marketing territories vary from New York City (population 7,781,984) to Webster, New York (population 3,060). Their customers range from farmers to factories; and their delivery problems, from hailstorms to look-alike apartment buildings.

All of them were eager for any and all information as to how efficiency gaps might be plugged. Most petroleum jobbers have a jack-of-all-trades approach to managing their companies—their operations are relatively small. As one jobber put it: "My company decided to send its president, treasurer, sales manager, public relations director, advertising manager, engineering department supervisor, personnel director, and training chief to this management conference. In other words, me!"

The jobbers arrived by car, train, and chartered seaplane and were greeted by Dr. Robert Snow, of

During their leisure hours the conferees went boating or swimming, played ping-pong, read, or slept. Two jobbers took up rod and reel and sallied forth in search of lake trout, but they returned emptyhanded.

A solitary jobber puts the final touches on a report he will make to a workshop session. Subjects at the conference ranged from accounting to service station dealer training to estate planning.

Syracuse University. He ushered them into their quarters in Minnowbrook Lodge, one of three Adirondack conference centers maintained by the university. Bunked two to a room, the jobbers were able to look out on calm Blue Mountain Lake, shadowed by the towering peak that gives the lake its name. Next came a tour of the 28-acre estate, from boathouse to putting green to recreation hall to library.

Attired in sports clothes and sporting plastic nametags, the jobbers later gathered in the main lounge of the lodge for introductions. Some adjourned to a "do-it-yourself" bar. Others argued over the stuffed animal-head trophies scattered along the walls. ("Elk are smaller and have different-shaped noses.") Some toasted themselves before a huge stone fireplace. ("It's homey but not as efficient as an oil burner.") A number simply propped their feet up on cobblers benches and talked of tank trucks and taxes, of how to help a dealer who needed money to send his boy through medical school, and of the mystifying case of the woman driver who said she never had used motor oil in her car and didn't "intend to start now."

A hot discussion dissected the causes of the American Revolution, a subject inspired by the Early American motif of the lodge. Two jobbers considered the benefits of drinking iced coffee all year round. Two more looked out over the lake and argued the relative merits of their favorite trout flies.

After their first meal together, the 21 jobbers convened in a classroom over the boathouse. A guest speaker, L. T. White, director of business education for an oil company, outlined the purposes of the conference and ticked off the ground rules. ("Relax, listen, talk.")

Meetings in the boathouse

Next morning the formal sessions began. Meetings were held in the boathouse classroom, in the main lounge, outdoors on the patio or lawn—even on the pier.

Dr. Walter Kell, of Syracuse, drove up from the university to lecture to the jobbers on his specialty, accounting. After class he was cornered by Syracuse alumnus Monte Gelfner, a Westchester jobber, for a rundown of Syracuse's chances of beating Holy Cross this football season.

Another speaker was John Shields, director of business education for an equipment manufacturer. Armed with his experience in attending 141 (!) management institutes and seminars conducted by petroleum jobbers, Shields shepherded the jobbers through some hot sessions on dealer training. He demonstrated some of the materials made available to them by their supplying oil companies—dealer recruitment kits, for example. Then Shields called upon the jobbers for some "do-it-yourself" instruction. The "students" were divided into three workshops for the purpose of discussing such topics as profit sharing, business diversification, and personnel relations. The members of the workshops carried their topics to lunch and to coffee breaks, picked away at them in the lounge and sitting in canoes. Time limits set for the evening discussions were ignored, and moose heads and elk heads rattled with arguments that ran well into the wee hours.

New equipment demonstrated

The workshop sessions were broken up by more formal meetings. For example, Bill Marran detailed some of the timesaving and sales-boosting methods he had developed in his Long Island heating oil business. He demonstrated new equipment aimed at raising oil burner efficiency.

There was time out for fun, too. Elmer Gordanier and Carl Wellington braved drenching rains to scout out the favorite haunts of lake trout on the first day of the conference. Their subsequent sallies with rod and reel came to nought, and their return emptyhanded brought hoots from their brother jobbers.

Lanky LeRoy Schneider, who supplies 60 service stations and a heating oil distributorship in Monroe, New York, took on all comers at table tennis and shuffleboard. He punctuated his serves with a rundown of his opinions on dealer training.

Occasionally some of the jobbers took time out to catch up on trade press reading and found a new source of discussion topics and argument. Others simply stretched out on couches and rent the mountain air with horrendous snores.

The one contact with "civilization" during the four-day conference consisted of a visit to nearby Blue Mountain Lake, a hamlet of 250 people. There the "students" eagerly read day-old newspapers. They also made a point of discussing mutual problems with a local service station dealer.

The final session of the conference dealt with a subject of universal concern. Bernard Levy, a lawyer and consultant for another petroleum trade association, lectured on estate planning. Many jobber companies are headed by a father who looks to his son as a business successor. Others are managed by husband-wife teams. The estate-planning lecture hit close to home.

After a hasty lunch the "students" packed bags and cars. The last words they exchanged concerned the stacks of mail that were awaiting them at the office. There were comments about "getting back to the family" and complaints about the starched business shirts that would soon replace open-necked sport shirts. And there was general agreement that they'd be around again next year for another bout with the rustic life.

Printed in U.S.A.

The stark, quiet beauty of form outlined against the Southwestern sky belies the busy modern magic that takes place hidden from the human eye in this natural gasoline plant near Orange, Texas. Here wet gases (propane and butane) and natural gasoline are separated from dry gases (methane and ethane).

JOHN
PIKE